AS 1428.1:2021

Australian STANDARD

STANDARDS Australia

Design for access and mobility

Part 1: General requirements for access — New building work

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Australian Industry Group
Australian Institute of Architects
Australian Institute of Building Surveyors
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Design for access and mobility

Part 1: General requirements for access — New building work

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Preface

This Standard was prepared by the Standards Australia Committee ME-064, Access for People with Disabilities, to supersede AS 1428.1:2009.

This document is part of a series that comprises the following:

AS 1428.1, *Design for access and mobility, Part 1: General requirements for access — New building work* (this Standard)

AS 1428.2, *Design for access and mobility, Part 2: Enhanced and additional requirements — Buildings and facilities*

AS/NZS 1428.4.1, *Design for access and mobility, Part 4.1: Means to assist the orientation of people with vision impairment — Tactile ground surface indicators*

AS 1428.4.2, *Design for access and mobility, Part 4.1: Means to assist the orientation of people with vision impairment — Wayfinding signs*

AS 1428.5, *Design for access and mobility, Part 5: Communication for people who are deaf or hearing impaired*

The objective of this document is to provide building designers and users (architects, property owners and regulators) with the minimum design requirements for new building work to enable access for people with disabilities.

Because of the variety of situations which may need to be addressed when designing buildings and facilities, it is seen as necessary for this document to provide a range of data so that the requirements for access can be met and allow for flexibility in design where limitations are imposed by other building conditions. The intention is to make this document a practical reference document for designers, particularly with regard to problem areas such as doorways and sanitary facilities.

The National Construction Code (NCC) and Disability (Access to Premises — Buildings) Standards define where access for people with a disability is required and reference a number of Australian Standards (including this document) to provide technical solutions to meet deemed-to-satisfy provisions.

The terms "normative" and "informative" are used in Standards to define the application of the appendices to which they apply. A "normative" appendix is an integral part of a Standard, whereas an "informative" appendix is only for information and guidance.

The use of Notes in this document are of an advisory nature only to give explanation or guidance to the user on recommended design considerations or technical procedures, or to provide an informative cross-reference to other documents or publications. Notes do not form a mandatory part for conformance to this document.

Contents

Introduction

This document describes basic minimum technical details for accessible buildings.

The National Construction Code (NCC) and Disability (Access to Premises — Buildings) Standards (Premises Standards) provide information on which classes of buildings are to be made accessible and prescribes the specific areas within those buildings where access must be provided. The NCC and Premises Standards refer to this document and other documents as a means of compliance with the deemed-to-satisfy access provisions of the NCC and Premises Standards.

Australian Standard®

Design for access and mobility

Part 1: General requirements for access — New building work

Section 1 Scope and general

1.1 Scope

This document specifies the design requirements for new building work, as required by the National Construction Code (NCC) and the Disability (Access to Premises — Buildings) Standards (Premises Standards), to provide access for people with disabilities. Particular attention is given to —

(a) continuous accessible paths of travel and circulation spaces for people who use wheelchairs;

(b) access and facilities for people with ambulatory disabilities; and

(c) access for people with sensory disabilities.

NOTE 1 The NCC and Premises Standards set out requirements for other features of the accessible built environment not covered in this document, such as lifts, hearing augmentation, tactile ground surface indicators, signage, glazing, lighting, car parking and toilet numbers, and distribution.

This document does not include requirements for —

(i) wheelchairs that have dimensions exceeding those shown in Figure 1; or

(ii) motorized scooters.

NOTE 2 Information on vision impairment is given in Appendix C.

1.2 Application

This document is referenced by the NCC and the Premises Standards for the provision of access for people with disabilities. As an NCC and Premises Standards referenced document, it is applicable to buildings as and when specified in the NCC and Premises Standards.

NOTE 1 Conformance to this document may also be required by other regulatory authorities.

This document provides the technical detail required to achieve the level of access for a deemed-to-satisfy solution.

The requirements specified in this document are intended to permit general use of buildings and facilities by people with disabilities acting independently, or where a person's usual method of operation is with an assistant, in the company of that assistant.

NOTE 2 This document is based on data resulting from empirical testing of persons aged between 18 and 60 years and may not be appropriate when applied to persons outside this age range.

The dimensions stated in this document, relevant to the use of wheelchairs, relate to the 80th percentile wheelchair size and user (see Figure 1), except at the following locations where the 90th percentile dimensions are required:

(a) On an accessway, at the location of a turn greater than 60°.

(b) New accessible sanitary facilities.

(c) At doorways, including door width and circulation space.

NOTE 3 The majority of the dimensions relevant to the 90th percentile in this document aligns with the findings of research undertaken by J. Bails, 1983 (see Bibliography).

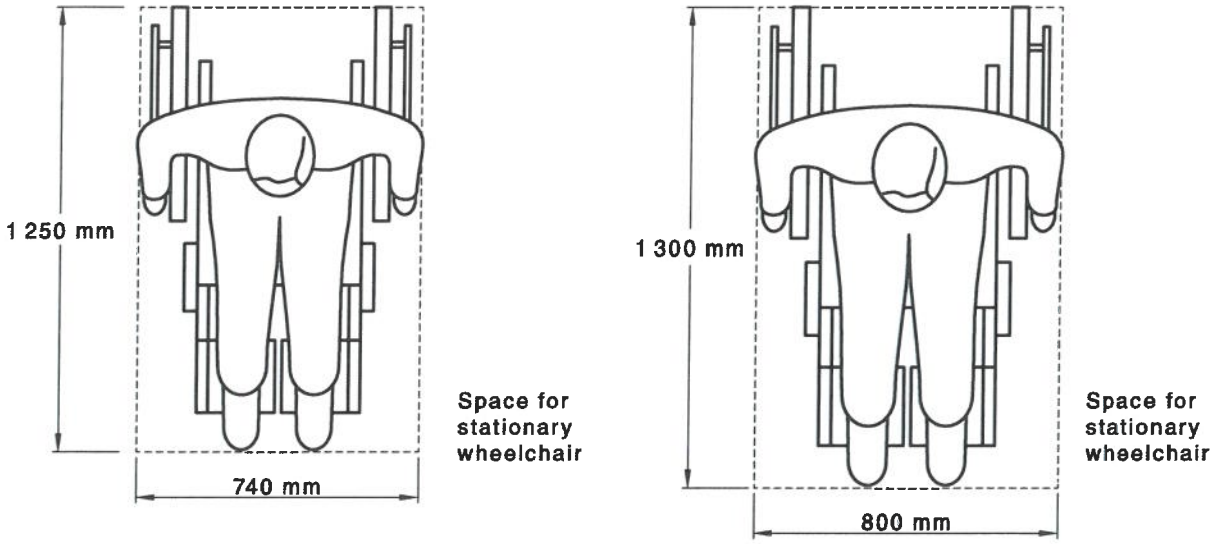


Figure 1 — Footprint for an occupied wheelchair

1.3 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document:

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 2700, *Colour standards for general purposes*

AS 1735.12, *Lifts, escalators and moving walks, Part 12: Facilities for persons with disabilities*

AS/NZS 1428.4.1, *Design for access and mobility, Part 4.1: Means to assist the orientation of people with vision impairment — Tactile ground surface indicators*

1.4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

1.4.1
accessible
having features to enable use by people with a disability

1.4.2
active leaf
in a door with two leaves, the leaf that carries the latching or locking mechanism and typically has an operable handle

1.4.3
angle of approach
angle between the centre-line of one continuous accessible path of travel and the centre-line of an intersecting continuous accessible path of travel

1.4.4
Braille
system of touch reading for the blind, which employs raised dots that are evenly arranged in quadrangular letter spaces or cells

1.4.5
circulation space
clear unobstructed area, to enable persons using mobility aids to manoeuvre

1.4.6
continuous accessible path of travel
uninterrupted path of travel to, into or within a building providing access to all accessible facilities

1.4.7
encroachment
the intrusion of a building component, fixture or fitment into a continuous accessible path of travel or circulation space

1.4.8
grate
cover in a pavement or floor or similar that allows water to enter a drain while accommodating foot and or wheeled traffic as per the site and usage context

1.4.9
hazard
any area or fixed object in or immediately adjacent to a direction of travel, which may place people at risk of injury

1.4.10
kerb
side barrier to a trafficable or accessible pedestrian surface

1.4.11
landing
flat or crowned surface with a gradient and crossfall not steeper than 1 in 40, to provide a rest area on a ramp, stairway or walkway

1.4.12
luminance contrast
the light reflected from one surface or component, compared to the light reflected from another surface or component

1.4.13
mixing valve
valve in which separate supplies of heated water and cold water are mixed together, either manually or automatically, to give a desired temperature from the mixed outlet

Note 1 to entry: The temperature of the mixed water is controlled by the operation of a control handle or handles.

1.4.14
outlet
portion of the tap assembly after the shut-off device where water flows for its intended use

1.4.15
people with ambulant disabilities
people who have a mobility disability but are able to walk

1.4.16
grabrail
rail used to give a steadying or stabilizing assistance to a person engaged in a particular function

1.4.17
handrail
rail used in circulation areas such as corridors, passageways, ramps and stairways to assist in continuous movement

1.4.18
ramp
inclined surface on a continuous accessible path of travel between two landings with a gradient steeper than 1 in 20 but not steeper than 1 in 14

1.4.19
ramp, kerb
inclined surface on a continuous accessible path of travel with a maximum rise of 190 mm, a length not greater than 1 520 mm and a gradient not steeper than 1 in 8, located within or attached to a kerb

1.4.20
ramp, step
inclined surface on a continuous accessible path of travel with a maximum rise of 190 mm, length not greater than 1 900 mm and a gradient not steeper than 1 in 10

1.4.21
ramp, threshold
inclined surface on a continuous accessible path of travel with a maximum rise of 35 mm, length not greater than 280 mm and a gradient not steeper than 1 in 8

1.4.22
slip-resistant
property of a surface having a frictional force-opposing movement of an object across a surface

1.4.23
sole occupancy unit
room or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant or other occupier and includes —

(a) a dwelling;

(b) a room or suite of rooms in a Class 3 building, as defined in the NCC, which includes sleeping facilities;

(c) a room or suite of associated rooms in a Class 5, 6, 7, 8 or 9 building, as defined in the NCC; or

(d) a room or suite of associated rooms in a Class 9c residential care building, as defined in the NCC, which includes sleeping facilities and any area for the exclusive use of a resident

1.4.24
tactile ground surface indicator
TGSI
truncated cones and/or bars installed on the ground or floor surface, designed to provide pedestrians who are blind or vision-impaired with warning or directional orientation information

Note 1 to entry: For requirements for TGSI, see AS 1428.4.1.

1.4.25
tactile signs
signage incorporating raised text, and/or symbols and Braille to enable touch reading by people who are blind or who are vision-impaired

1.4.26
walkway
any surface on a continuous accessible path of travel with a gradient not steeper than 1 in 20

Section 2 Dimensions

The dimensions given throughout this document are in millimetres unless shown otherwise. All dimensions are net and shall not be reduced by projecting skirtings, kerbs, handrails or other fixtures.

Dimensions refer to finished surfaces (e.g. face of wall tiles and floor finishes).

NOTE Dimensioning to the limit of a range is likely to lead to nonconformities. Good practice in design and documentation aims to allow building tolerances. Clearance dimensions in this document refer to finished surfaces, not to those of structural elements.

Unless otherwise indicated, limiting dimensions for an inclined surface on a continuous accessible path of travel shall be taken as horizontal and vertical only.

Section 3 Continuous accessible paths of travel

3.1 General

A continuous accessible path of travel shall not include a step, stairway, turnstile, revolving door, escalator, moving walk or other impediment.

NOTE When setting out works using the dimensions in this section, make appropriate allowances for construction tolerance (see Section 2).

3.2 Heights of a continuous accessible path of travel

The minimum unobstructed height of a continuous accessible path of travel shall be 2 000 mm or 1 980 mm at doorways (see Figure 2).

3.3 Width of a continuous accessible path of travel

Unless otherwise specified (such as at doors, curved ramps and similar), the minimum unobstructed width (see Figure 2) **of a continuous accessible path of travel shall be 1 000 mm except in the case** of a curved ramp or walkway (see Clause 7.4 (d)). The following shall not intrude into the minimum unobstructed width of a continuous accessible path of travel:

(a) **Fixtures and fittings such as lights, awnings, windows that, when open, intrude into the** circulation space, telephones, skirtings and similar objects.

(b) **Essential fixtures and fittings such as fire hose reels, fire extinguishers and switchboards.**

(c) **Door handles less than 900 mm above the finished floor level.**

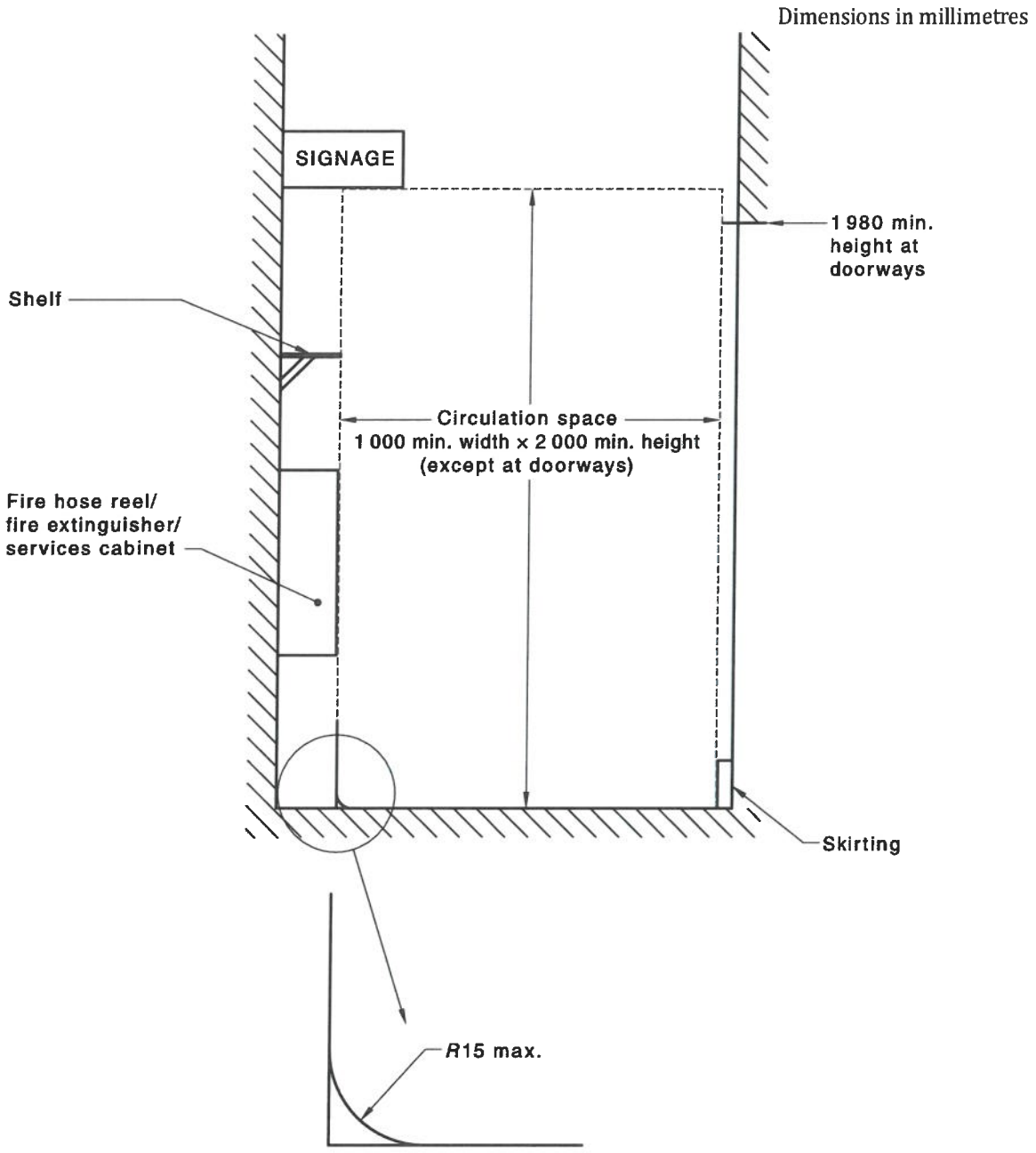


Figure 2 — Continuous accessible path of travel — Minimum height and width

3.4 Passing space for wheelchairs

Passing space for 2 persons using wheelchairs shall be a minimum width of 1 800 mm for a minimum length of 2 000 mm.

See Section 7 for gradient and crossfall requirements.

NOTE For examples see Figure 3.

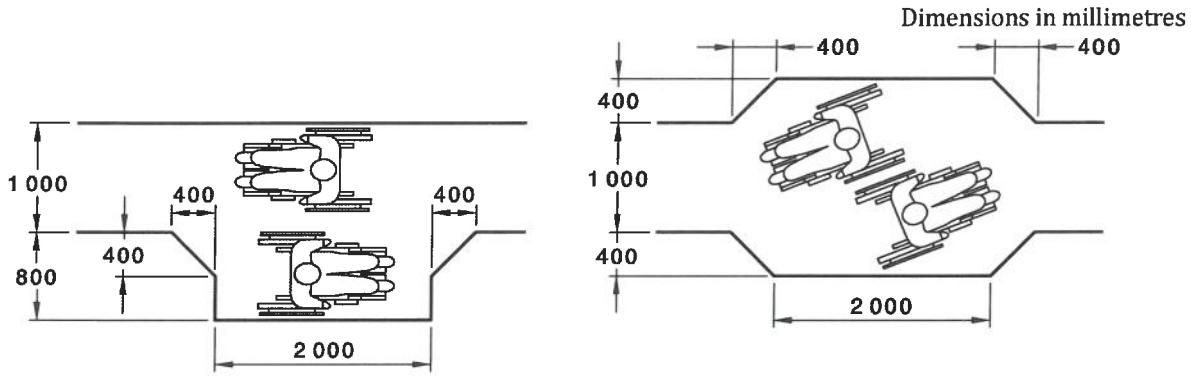


Figure 3 — Examples for passing space for wheelchairs

3.5 Circulation space for wheelchair turn

3.5.1 General

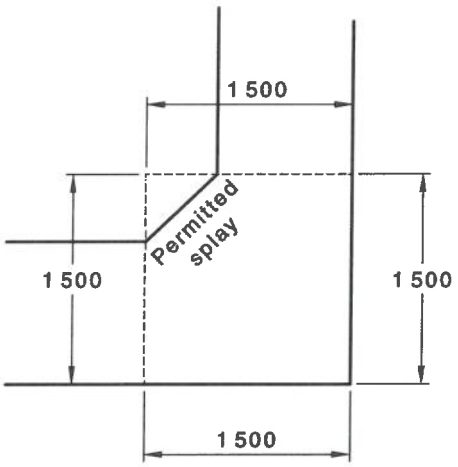
See Section 7 for gradient and crossfall requirements.

3.5.2 60° to 90° turn

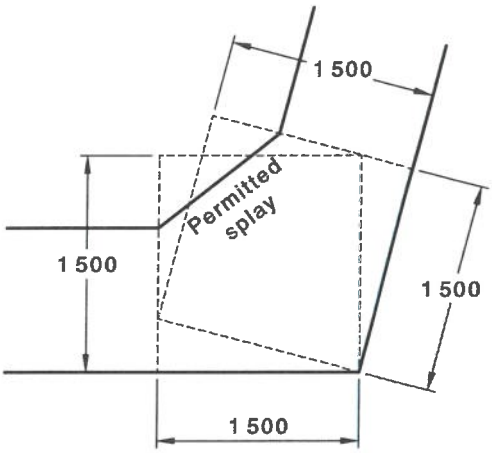
A space required for a wheelchair to make a 60° to 90° turn shall be not less than 1 500 mm wide and 1 500 mm long in the direction of travel. Where the width of the path of travel is less than 1 500 mm, the space may be splayed across the internal corner as shown in Figure 4.

3.5.3 30° to < 60° turn

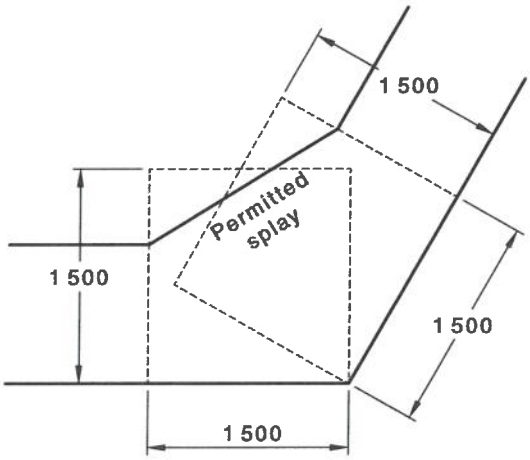
Where the angle of turn is 30° to less than 60° and the width of the path of travel is less than 1 200 mm, a splay of at least 500 mm × 500 mm shall be made on the internal corner, as shown in Figure 4.



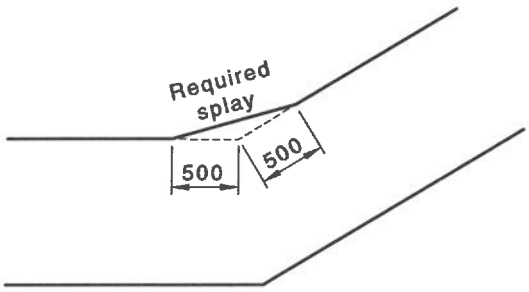
Turn 90° in path of travel
Corridor less than 1 500 mm wide requires widening at turn



Turn 75° in path of travel
Corridor less than 1 500 mm wide requires widening at turn



Turn 60° in path of travel
Corridor less than 1 500 mm wide requires widening at turn



Turn 30° to < 60° in path of travel
less than 1 200 mm wide

All dimensions are minimum

Figure 4 — Space required for a 30° to 90° turn

3.5.4 Greater than 90° to 180° turn

The space required for a wheelchair to make a greater than 90° to 180° turn shall be not less than 2 070 mm in the direction of travel and not less than 1 540 mm wide, as shown in Figure 5.

NOTE For landing dimensions, see Clause 7.8.

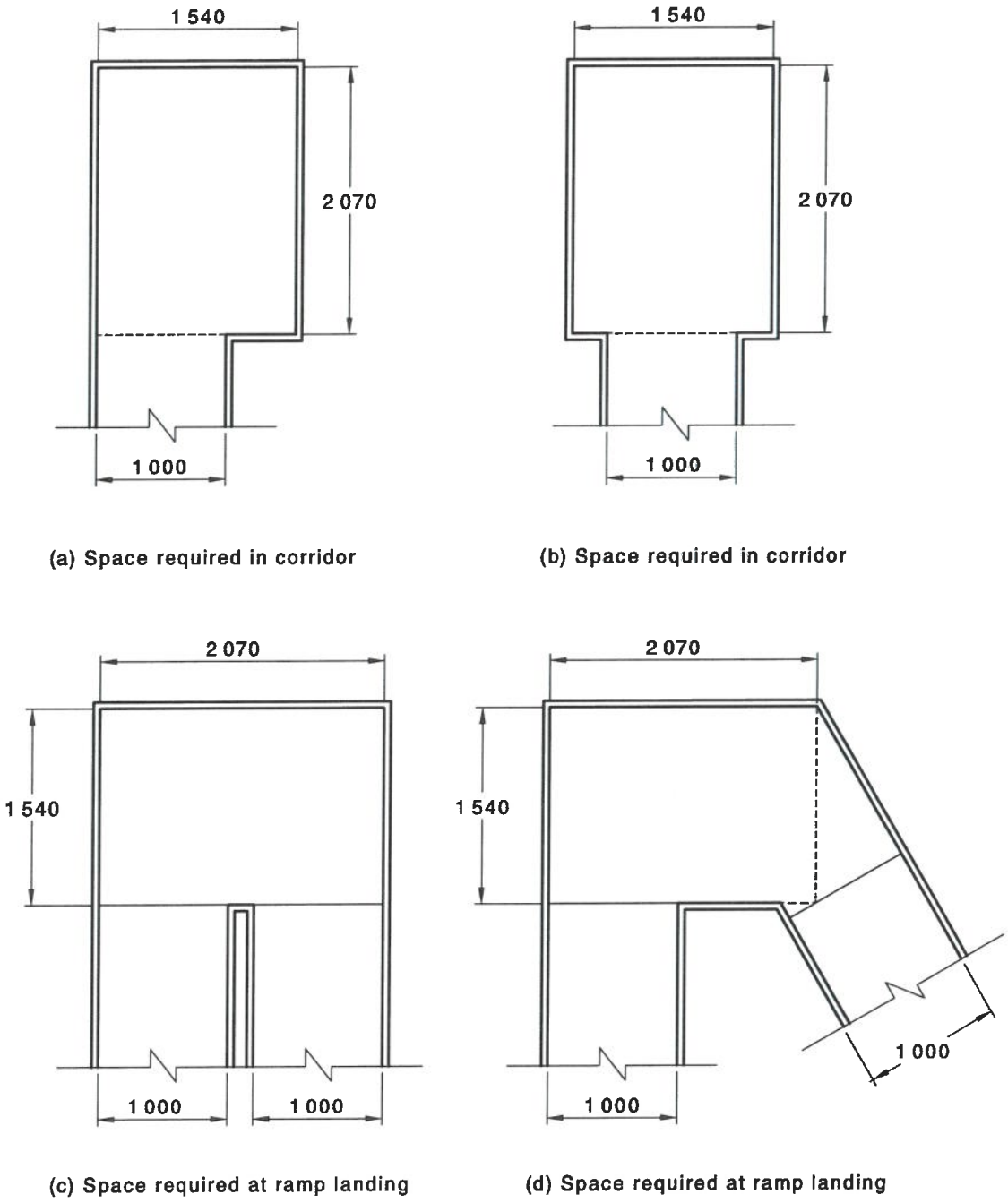


Figure 5 — Space required for a greater than 90° to 180° turn

3.6 Visual indicators on glazing

Where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights, including any glazing capable of being mistaken for a doorway or opening, shall be clearly marked for their full width with an unbroken, solid and opaque contrasting line. The contrasting line shall be not less than 75 mm high and shall extend across the full width of the glazing panel. The lower edge of the contrasting line shall be located between 900 mm and 1 000 mm above the plane of the finished floor level.

Any contrasting line on the glazing shall provide a minimum of 30 % luminance contrast when viewed against the floor surface or surfaces within 2 m of the glazing on the opposite side. The contrast shall be achieved when viewed from each side of the glazing.

The opacity of the line shall be tested by observing a solid object placed immediately behind and touching the glass. The line shall be considered opaque if there is no image of the object visible.

NOTE 1 On tinted glass, the contrast of the strip may be more appropriately considered against the glass tint than the floor beyond.

NOTE 2 Any logo, branding, company name or the like may be added to the visual indicator strip, but these should be fully above, or fully below the minimum 75 mm wide unbroken, solid and opaque contrasting line.

NOTE 3 AS 1288:2006 Section 5 provides further information relating to the criteria and situations relevant to glazing that is more vulnerable to human impact.

3.7 Glazed viewing panels

Glazed viewing panels in doors shall conform to AS 1288.

NOTE Glazed viewing panels in doors should be as follows (see Figure 36 (a)):

(a) The lower edge of the glazing should be not more than 1000 mm above the plane of the finished floor.

(b) The upper edge of the glazing should be not less than 1600 mm above the plane of the finished floor.

(c) In width, the glazing should extend to within not more than 200 mm from the latch edge of the door and be not less than 150 mm wide.

Section 4 Floor or ground surfaces on continuous accessible paths of travel and circulation spaces

4.1 General

A continuous accessible path of travel and any circulation spaces shall have a slip-resistant surface. The texture of the surface shall be traversable by people who use a wheelchair and those with an ambulant or sensory disability.

NOTE 1 Information relevant to slip resistance can be found in AS 4586, AS 4663, HB 197, and SA HB 198.

NOTE 2 When setting out works using the dimensions in this section, make appropriate allowances for construction tolerance (see Section 2).

4.2 Construction tolerances at abutment of surfaces

Abutment of surfaces shall have a smooth transition. Design transition shall be 0 mm. Construction tolerances shall be as follows:

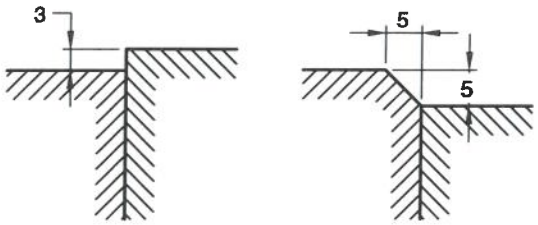
(a) 0 ± 3 mm vertical; and

(b) 0 ± 5 mm, provided the higher edge is bevelled or rounded to reduce the likelihood of tripping as shown in Figure 6 (a).

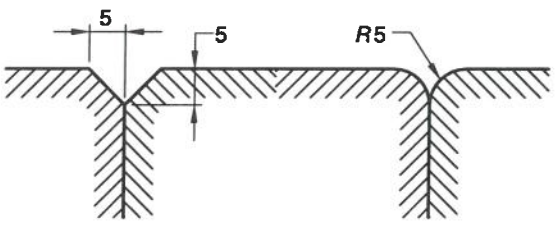
Design allowance for the joints of abutting pavers shall be as shown in Figure 6 (b).

Design allowance for joints in pavers shall be as shown in Figure 7A. Design allowance for timber decking and boardwalks shall be as shown in Figure 7B.

Dimensions in millimetres



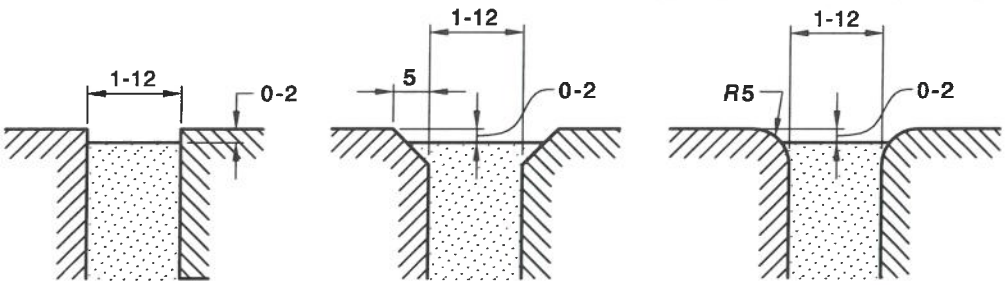
(a) Change in level



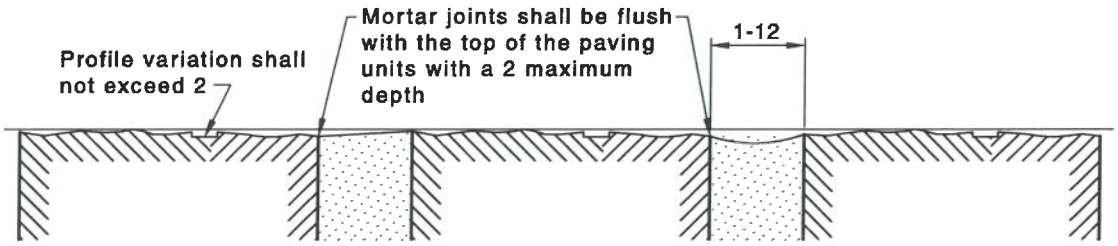
(b) Continuous paving units — flush-jointed with level surfaces

Figure 6 — Acceptable construction tolerances for abutment of surfaces

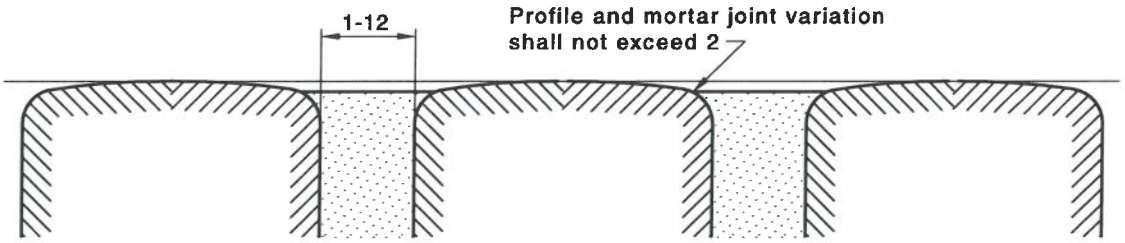
Dimensions in millimetres and are maximum



(a) Continuous paving units — Level surface

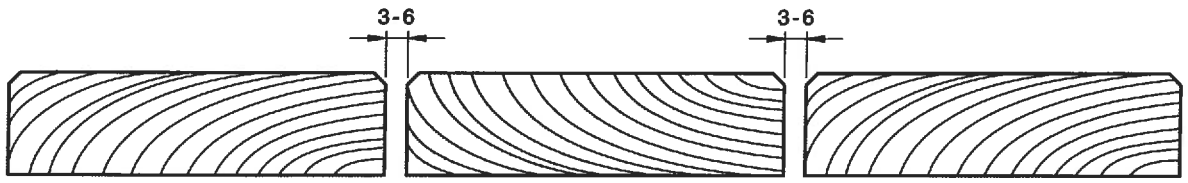


(b) Continuous paving units — Irregular surfaces

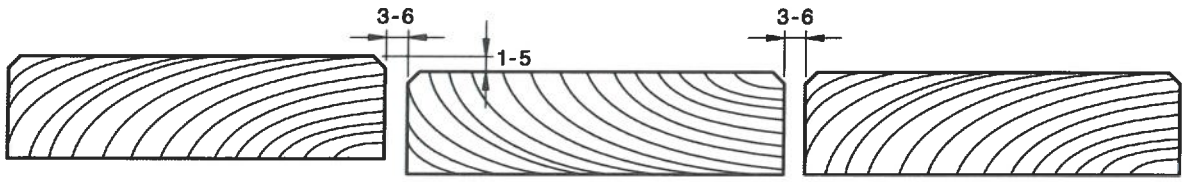


(c) Continuous paving units — Domed surfaces

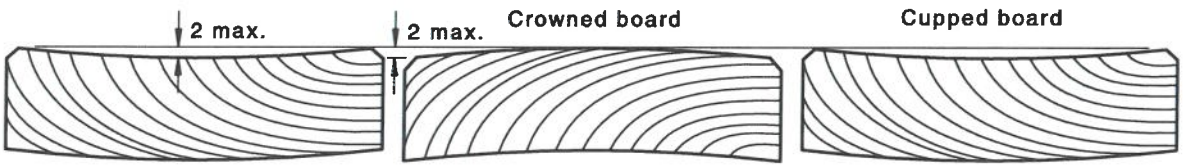
Figure 7(A) — Raked joint pavers



(a) Gap spacing for continuous timber and composite decking
* Gaps maybe increased to 10 mm in high rainfall areas for exposed installations and boards exceeding 150 mm width



(b) Single incidence of change in level on timber and composite decking



(c) Uneven surface tolerances for continuous timber and composite decking

Figure 7(B) — Timber decking and boardwalks

4.3 Floor coverings

4.3.1 Carpets and other soft flexible materials

Where carpets or any soft flexible materials are used on the ground or floor surface —

(a) the pile height or pile thickness shall not exceed 11 mm and the carpet backing thickness shall not exceed 4 mm; and

(b) the carpet pile height or pile thickness dimension, carpet backing thickness dimension and the combined dimensions shall be a maximum of 11 mm, maximum of 4 mm and a maximum of 15 mm respectively.

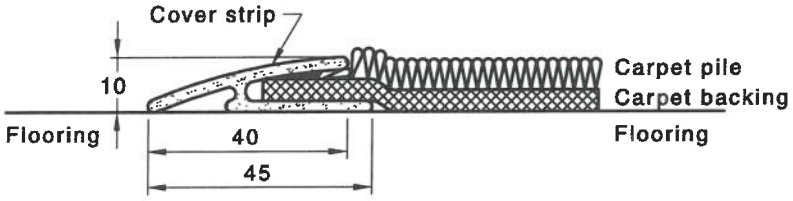
NOTE An example is given in Figure 8.

Abutting floor coverings shall have a smooth transition. At the leading edge, carpet trim and mat edges shall have a vertical face no higher than 3 mm, or a rounded or bevelled edge no higher than 5 mm or above that height a gradient of 1:4 up to a maximum of 10 mm.

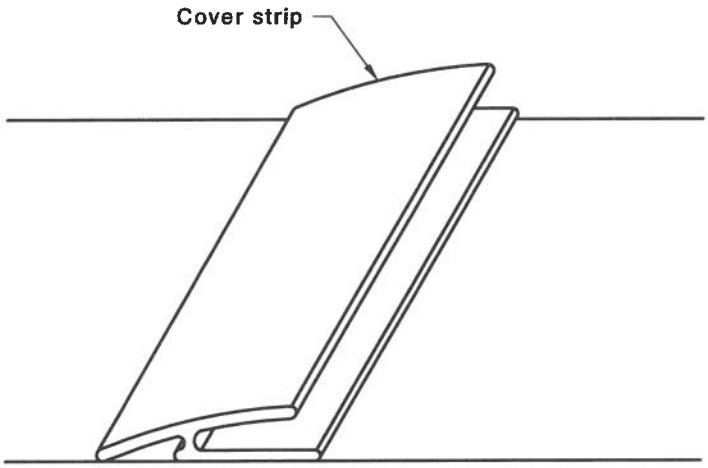
A range of trims are available, such as curved metal covers, cap vinyl covers, small and larger threshold trims, flat metal covers, metal edge trims, smooth edge trims, plank ramp and the like.

This clause also applies to mats, rugs and temporary matting/rugs on other floor finishes.

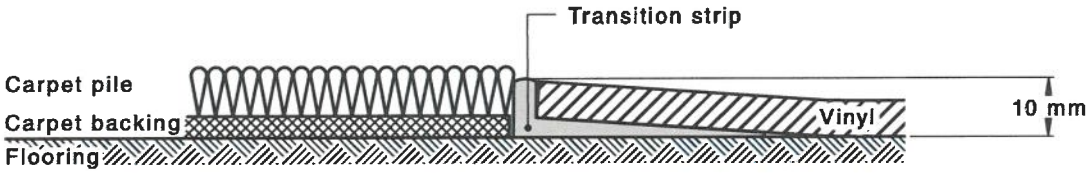
Dimensions in millimetres



(a) Optional section A



(b) View of optional section A



(c) Optional section B

Figure 8 — Example of abutting floor coverings on a continuous accessible part path of travel

4.4 Grates

Grates in paths of travel shall be in accordance with the following:

(a) Circular openings shall be not greater than 13 mm in diameter.

(b) Slotted openings shall be not greater than 13 mm wide and not greater than 150 mm long and be oriented so that the long dimension is transverse to the dominant direction of travel.

(c) Linear openings shall be oriented so that the longer dimension is transverse to the dominant direction of travel, except where linear openings are less than 8 mm wide. Where linear openings are less than 8 mm wide, orientation is optional.

4.5 Timber decking and boardwalks

The gap between boards depends on the type of board used and the location of the installation.

For decking boards no greater than 150mm wide the installation shall be designed for a maximum 6 mm gap.

Adjacent boards shall be level within a maximum vertical 3 mm tolerance.

For decking boards over 150 mm wide the gap may be increased to a maximum of 10 mm. Where the gap exceeds 8 mm the boards shall run transverse to the direction of travel.

The fixing method shall maintain the tolerances shown in Figure 8.

NOTE 1 Decking and boardwalks may be constructed from hardwood timber, softwood timber or manufactured products. These all react differently in the environment and the choice of materials should take the specific site into consideration.

NOTE 2 As the materials are subject to environmental conditions, regular maintenance may be required to ensure the installation requirements are maintained.

Section 5 Signage

5.1 Form of signs

The NCC contains requirements for Braille and tactile signage.

Where signs are required, the form of signs shall be as follows:

(a) Where required by the NCC, raised tactile and/or Braille signage shall be provided as follows:

(i) Sanitary facilities shall be identified with the following:

(A) Raised and visual versions of the international symbol of access.

(B) Raised and visual versions of the male and female symbols.

(C) Raised text that shall be in title case (e.g. Male Toilet).

NOTE 1 Title case has the first letter of each word capitalized and the rest are lower case. Short articles, prepositions and conjunctions are not capitalized.

(D) Braille that fully describes the visual information displayed by symbols and raised text.

NOTE 2 For example, a sign for a male toilet will include the words "Male Toilet" as visual, raised text and Braille as well as the raised visual male symbol.

NOTE 3 An example of a sign is given in Figure 9(A).

(ii) Signs for unisex accessible facilities shall be provided with the letters LH or RH to indicate a left-hand or right-hand side transfer onto the WC pan. The minimum font size shall be 20 mm san serif.

NOTE 4 An example of right-hand side (RH) transfer is shown in Figure 9(A).

NOTE 5 Helvetica and Arial are san serif fonts.

(iii) Entry doors to airlocks serving areas containing sanitary facilities shall be identified by the use of raised text and Braille, together with raised and visual symbols identifying each sanitary facility within.

NOTE 6 One symbol for each facility need only be used.

NOTE 7 Where the facilities for male and female are separate, a dividing line should be placed between each symbol.

(b) Elements of a sign shall be set out singularly, or in a modular form.

NOTE 8 Examples of modular form are shown in Figures 9(A), 9(D), 9(E) and 9(F).

(c) Elements of a sign shall be arranged horizontally or vertically and shall include raised text and Braille, together with raised and visual symbols. Where words are used, they shall be displayed horizontally.

NOTE 9 Other symbols may be used in association with the text.

(d) Facilities shall be identified by the use of raised text, Braille, and symbols if required. The identification shall be between 1 200 mm and 1 600 mm above finished floor levels.

(e) A sanitary compartment for people with ambulant disabilities shall be identified in accordance with Figure 9(C).

Braille shall be Unified English Braille (UEB), Grade 1, uncontracted, and shall be in accordance with the technical specifications set out by the Australian Braille Authority (ABA). Braille numerals shall be preceded by a Braille numerical sign.

The International Symbol of Access and the International Symbol for Deafness (see Clause 5.2) may be used without raised explanatory text such as "accessible" or "hearing loop installed".

NOTE 1 The Braille indicator is only used where there are multiple lines of text. It indicates the location of the first line of Braille.

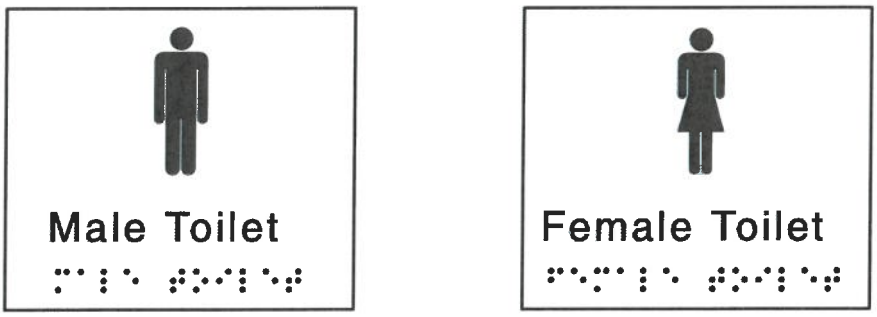
NOTE 2 Visual message: The sign displays a unisex accessible toilet with right-hand (RH) transfer.

NOTE 3 Minimum required raised tactile message: "Unisex Toilet RH" in raised tactile print and symbols.

NOTE 4 Minimum required Braille message: "Unisex accessible toilet rh" for right-hand transfer.

NOTE 5 The Braille in this figure is not to scale.

Figure 9(A) — Modular form of signs — Example of identification sign for a unisex accessible toilet with a right-hand (RH) transfer



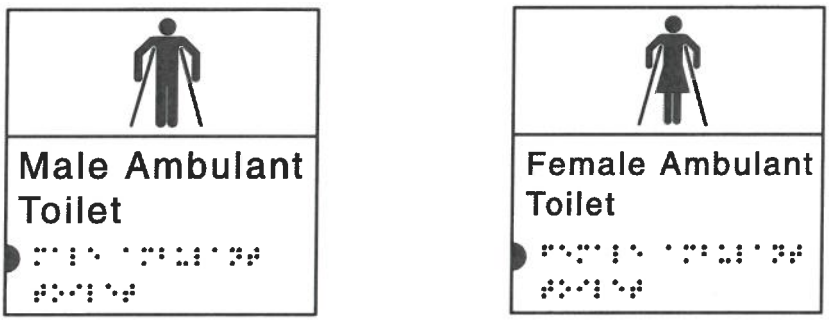
NOTE 1 Visual message: The signs display male toilet and female toilet.

NOTE 2 Minimum required raised tactile message: "Male Toilet", "Female Toilet" in raised tactile print and symbols.

NOTE 3 Minimum required Braille message: "Male Toilet", "Female Toilet".

NOTE 4 The Braille in this figure is not to scale.

Figure 9(B) — Modular form of signs — Example of dentification signs for male and female toilets



NOTE 1 Visual message: The signs display ambulant accessible male and female toilets.

NOTE 2 Minimum required raised tactile message: "Male Ambulant Toilet", "Female Ambulant Toilet" in raised tactile print and symbols.

NOTE 3 Minimum required Braille message: "Male Ambulant Toilet", "Female Ambulant Toilet".

NOTE 4 The Braille in this figure is not to scale.

Figure 9(C) — Modular form of signs — Example of identification signs for ambulant accessible male and female toilets

NOTE 1 Visual message: The sign displays the direction to a unisex accessible toilet with left-hand (LH) transfer.

NOTE 2 Minimum required tactile message: "Unisex Toilet LH" with raised tactile wayfinding arrow, print and symbols.

NOTE 3 Minimum required Braille message: "unisex accessible toilet lh" with a wayfinding arrow of Braille cell proportion.

NOTE 4 The Braille in this figure is not to scale.

Figure 9(D) — Modular form of signs — Example of wayfinding sign to a unisex accessible toilet with left hand (LH) transfer

NOTE 1 Visual message: The sign displays an accessible path of travel using a lift to level 3 to a unisex accessible toilet.

NOTE 2 Minimum required tactile message: "Unisex Toilet Level 3" with raised tactile symbols and print.

NOTE 3 Minimum required Braille message: "Braille arrow unisex accessible toilet on level 3 use lift" with a wayfinding arrow of Braille cell proportion.

NOTE 4 The Braille in this figure is not to scale.

Figure 9(E) — Modular form of signs — Example of wayfinding sign to a unisex accessible toilet

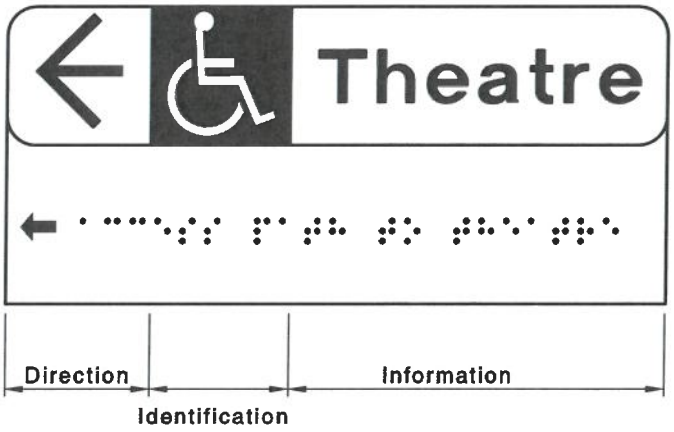


Figure 9(F) — Modular form of signs Example of wayfinding sign to identify facilities for persons with mobility disabilities

5.2 Symbols indicating access for people with disabilities

5.2.1 International symbol of access

The form of the international symbol of access shall be as follows:

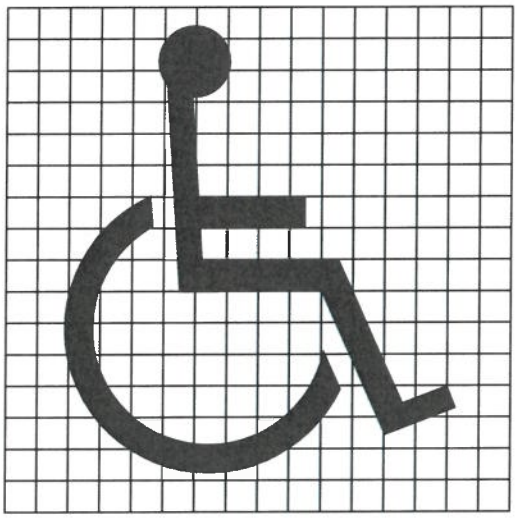
(a) The symbol of access shall consist of two elements: a stylized figure in a wheelchair pointing to the right on a plain square background.

(b) The proportional layout of the symbol of access shall be in accordance with Figure 10.

(c) The colour of the Figure shall be white on a blue background in accordance with Figure 11. The blue shall be B21, ultramarine, of AS 2700, or similar.

(d) For signs indicating the direction to a facility, an arrow shall be used in combination with the international symbol of access.

NOTE Signs identifying a facility may be used either with or without directional arrows.



NOTE The grid is for positional purposes only.

Figure 10 — Proportional layout for international symbol of access

Figure 11 — Colour contrast for symbol of access

5.2.2 International symbol for deafness

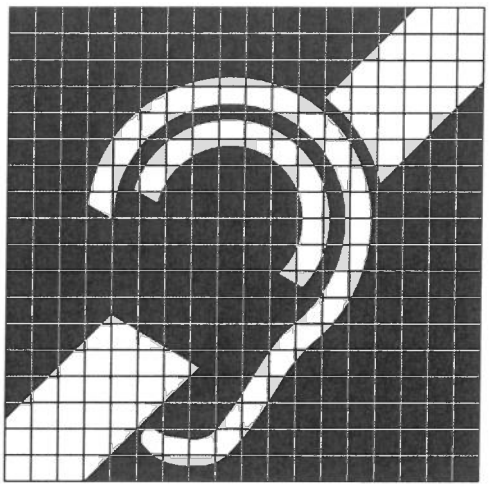
The form of the international symbol for deafness shall be as follows:

(a) The symbol for deafness shall consist of two elements: a stylized ear and diagonal slash on a plain square background.

(b) The proportional layout of the symbol for deafness shall be in accordance with Figure 12.

(c) The colour of the symbol shall be white on a blue background. The blue shall be B21, ultramarine, of AS 2700, or similar.

(d) The symbol shall not incorporate the letter "T" or any other symbol or lettering.



NOTE The grid is for positional purposes only.

Figure 12 — Proportional layout for international symbol for deafness

Section 6 Tactile ground surface indicators

Tactile ground surface indicators (TGSIs) to warn people of hazards shall be in accordance with AS/NZS 1428.4.1.

Section 7 Walkways, ramps and landings

7.1 General

Walkways, ramps and landings that are provided on a continuous accessible path of travel shall be as follows:

(a) Sharp transitions shall be provided between the planes of landings and ramps, as shown in Figure 14.

(b) Landings shall be provided at all changes in direction in accordance with Clause 7.8.

(c) Landing or circulation space shall be provided at every doorway, gate, or similar opening.

(d) The crossfall for a walkway or landing shall be no steeper than 1 in 40, except that bitumen surfaces shall have a camber or crossfall no steeper than 1 in 33.

NOTE 1 For requirements for ground surfaces, see Section 4.

NOTE 2 When setting out works using the dimensions in this section, make appropriate allowances for construction tolerance (see Section 2).

7.2 Walkways

Walkways shall be in accordance with the following:

(a) The floor or ground surface abutting the sides of the walkway shall provide a firm and level surface of a different material to that of the walkway at the same level of the walkway, follow the grade of the walkway and extend horizontally for a minimum of 600 mm unless one of the following is provided:

(i) Kerb in accordance with Figure 18; or

(ii) Kerb rail and handrail in accordance with Figure 19; or

(iii) A wall, fence, balustrade or similar barrier.

In the case of a street kerb, the minimum width of the walkway shall be increased by 600 mm at that side as shown in Figures 24(B) and 24(C).

(b) Walkways shall be provided with landings, as specified in Clause 7.8, at intervals not exceeding the following:

(i) For walkway gradients of 1 in 33, at intervals no greater than 25 m.

(ii) For walkway gradients of 1 in 20, at intervals no greater than 15 m.

(iii) For walkway gradients between 1 in 20 to 1 in 33, at intervals that shall be obtained by linear interpolation.

For walkways shallower than 1 in 33, no landings are required.

The intervals specified above may be increased by 30 % where at least one side of a walkway is bounded by —

(iv) a kerb or kerb rail as specified in Clause 7.3(j) and a handrail as specified in Clause 9; or

(v) a wall and a handrail as specified in Clause 9.

7.3 Ramps

Ramps shall be in accordance with the following:

(a) The maximum gradient of a ramp exceeding 1 900 mm in length shall be 1 in 14.

(b) The gradient of a ramp shall be constant throughout its length with a maximum allowable tolerance of 3 % provided no section of the ramp is steeper than 1 in 14.

(c) Ramps shall be provided with landings, as specified in Clause 7.8, at the bottom and at the top of the ramp and at intervals not exceeding the following:

   (i) For ramp gradients of 1 in 14, at intervals not greater than 9 m.

   (ii) For ramp gradients steeper than 1 in 20, at intervals not greater than 15 m.

   (iii) For ramp gradients between 1 in 14 and steeper than 1 in 20, at intervals that shall be obtained by linear interpolation.

(d) Where ramps are constructed with a change in direction, the angle of approach shall create a 90° angle to the line of transition between the ramp surface and the landing surface, as shown in Figure 13.

(e) Ramps shall have a handrail in accordance with Clause 9 on each side of the ramp, as shown in Figure 14.

   NOTE 1 Figures 15(A) and 15(B) show examples of suitable ramp handrail terminations.

(f) Where the intersection is at the property boundary, the ramp shall be set back by a minimum of 900 mm so that the handrail (in accordance with Clause 9) and TGSIs do not protrude into the transverse path, as shown in Figure 16.

(g) TGSIs shall be installed in accordance with AS 1428.4.1.

(h) Where the intersection is at an internal corridor, the ramp shall be set back by a minimum of 400 mm so that the handrail in accordance with Clause 9 does not protrude into the transverse path of travel as shown in Figure 17.

(i) The handrail shall extend a minimum of 300 mm horizontally past the transition point at the top and bottom of the ramp except where the inner handrail is continuous at an intermediate landing.

(j) Where a handrail is not supported on a wall, ramps and intermediate landings shall have kerbs or kerb rails in accordance with the following:

   (i) The minimum height above the finished floor shall be 65 mm.

   (ii) The height of the top of the kerb or kerb rail shall not be within the range 75 mm to 150 mm above the finished floor, as shown in Figure 18.

   (iii) There shall be no longitudinal gap or slot greater than 20 mm in the kerb or kerb rail within the range 75 mm to 150 mm above the finished floor.

      NOTE 2 For details on kerbs and kerb rails, see Figure 18.

      NOTE 3 For location of kerb or kerb rail, see Figure 19.

      NOTE 4 Examples of kerb rail configuration are shown in Appendix A.

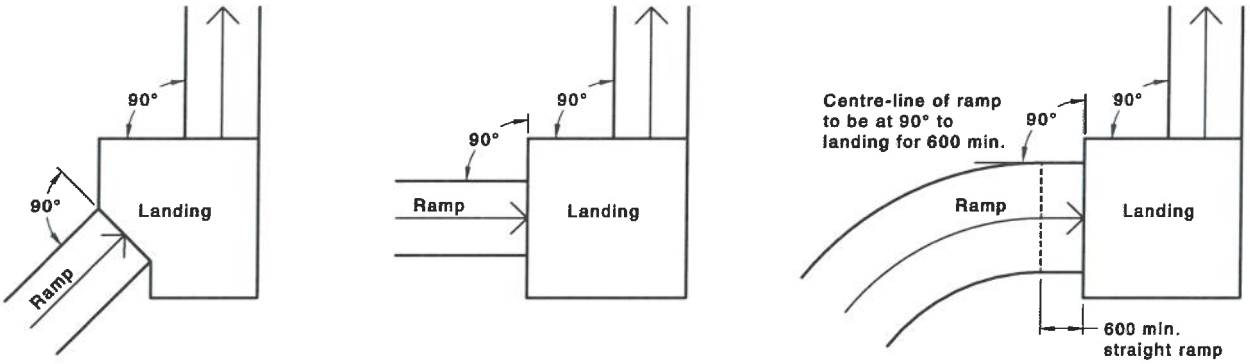
(k) Kerbs or kerb rails shall —

(i) be located so that the ramp-side face is either flush with the ramp-side face of the handrail or no greater than 100 mm away from the ramp-side face of the handrail, as shown in Figure 19;

(ii) where the handrail is supported on a vertical post, the height of the top of the kerb or kerb rail shall be not less than 150 mm above the finished floor, as shown in Figure 19 (a), (b) or (c); and

(iii) where the kerb is at a height of 65 mm to 75 mm, the support posts shall be set back a minimum of 200 mm from the face of the kerb or kerb rail, as shown in Figure 19 (d).

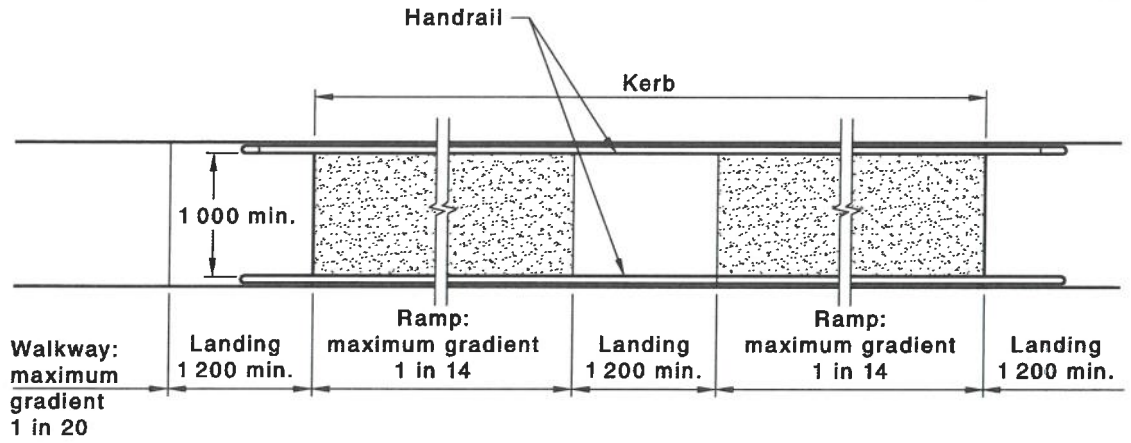
Dimensions in millimetres



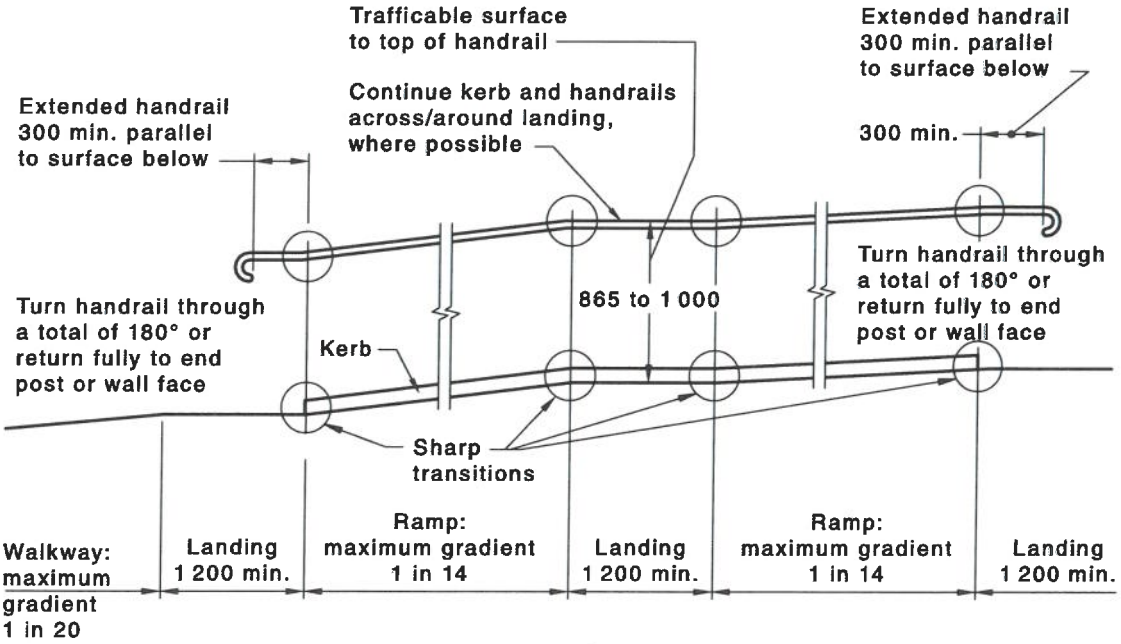
(a) Angled approach (b) Straight approach (c) Curved approach

Figure 13 — Angle of approach between ramp and landing

Dimensions in millimetres

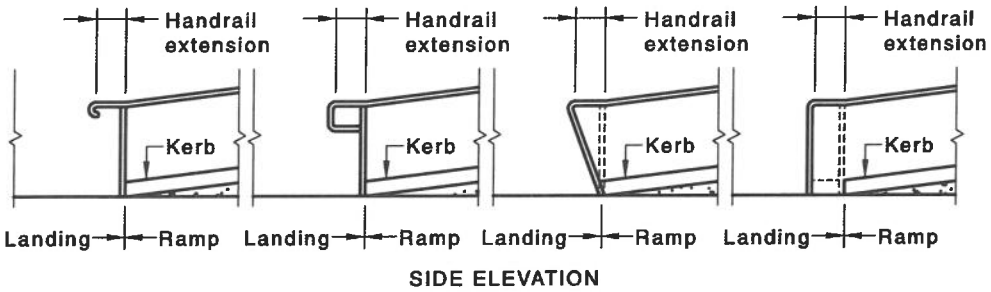


(a) Plan view

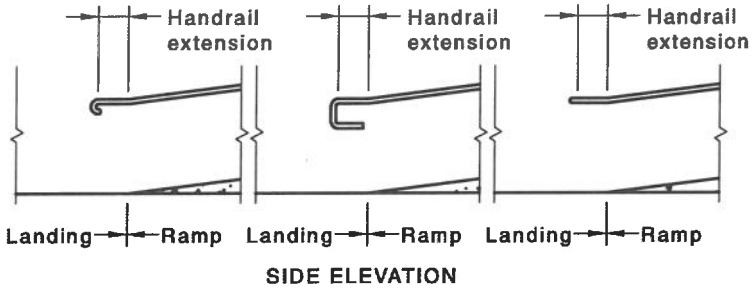


(b) Elevation

Figure 14 — Ramp handrails



(a) Post mounted handrails



(b) Wall mounted handrails

Figure 15(A) — Ramp handrails - Examples of handrail terminations

Dimensions in millimetres

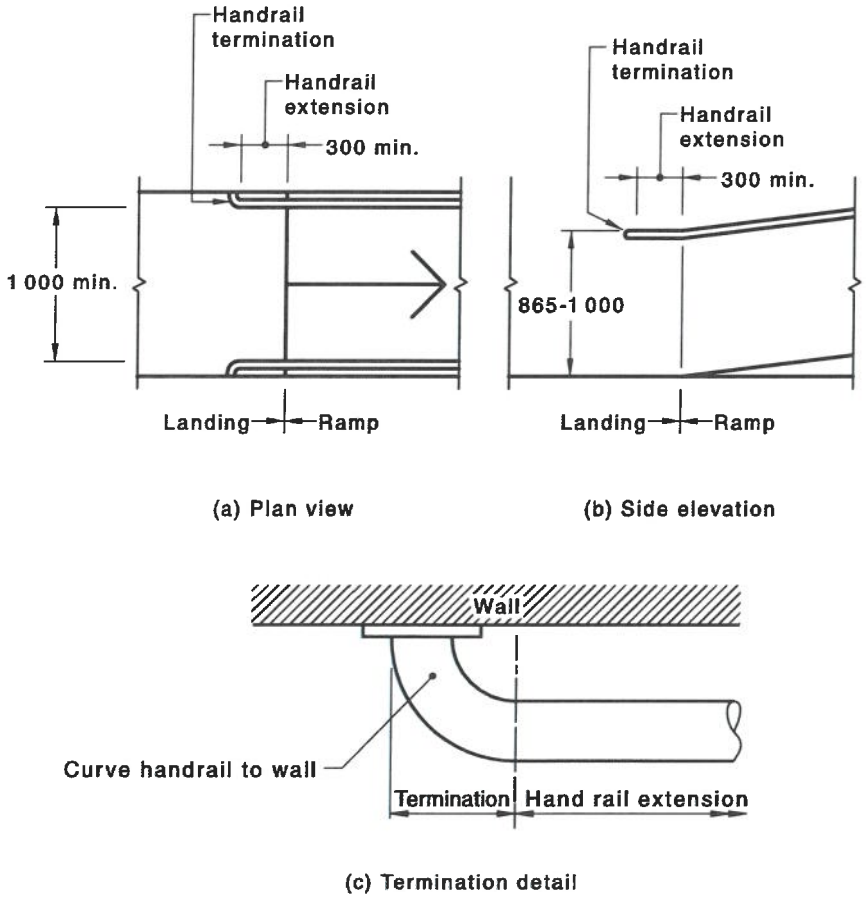


Figure 15(B) — Ramp handrails — Detail for handrails terminated by turning horizontally through 90° to the wall

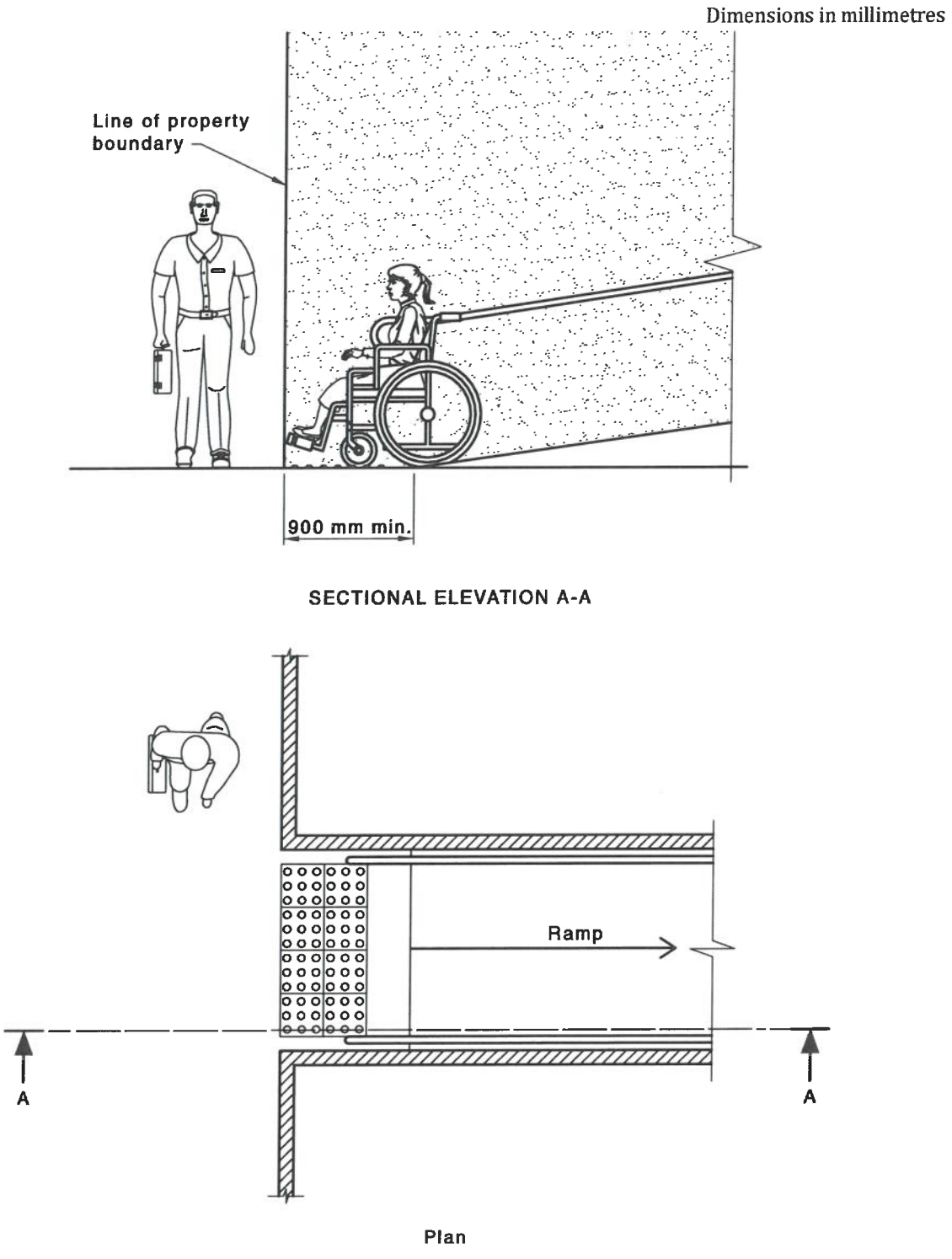
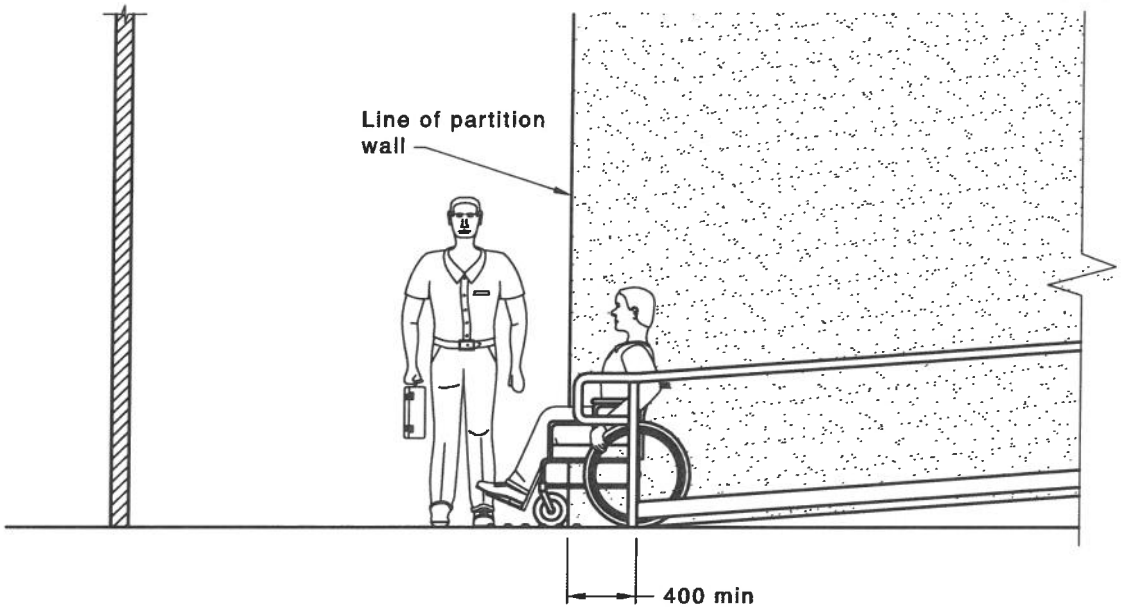
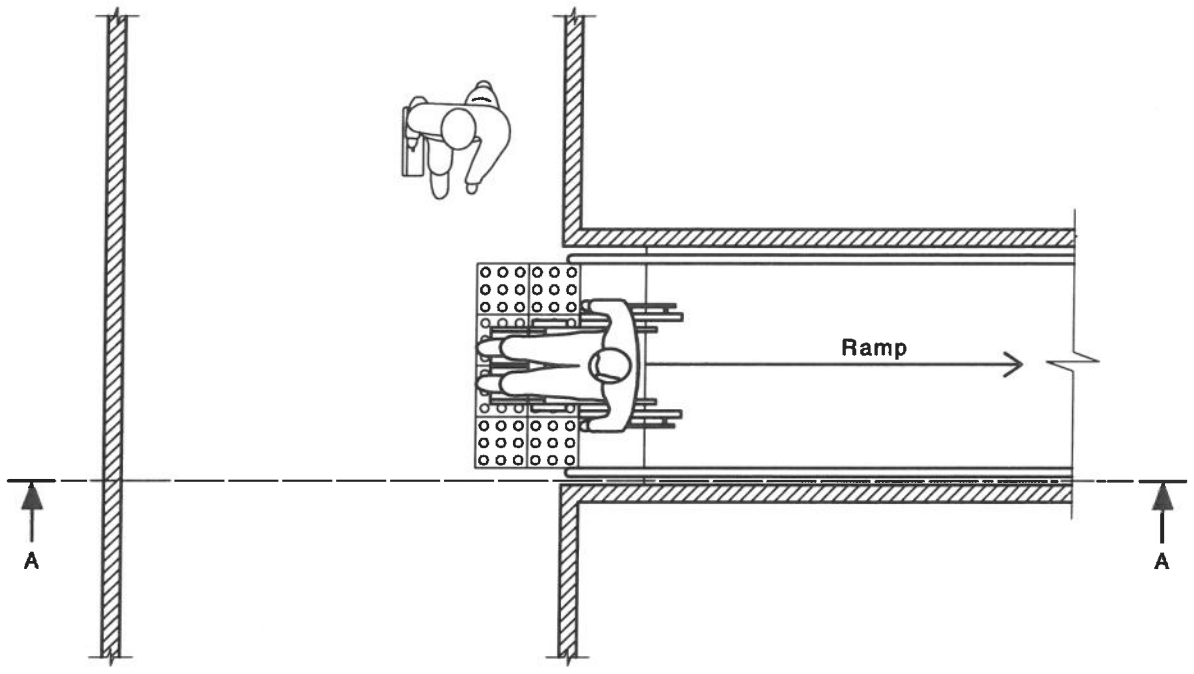


Figure 16 — Location of ramp at a boundary to prevent protrusion of handrails and tactile ground surface indicators (TGSIs) into a transverse path of travel

Dimensions in millimetres



SECTIONAL ELEVATION A-A



PLAN

NOTE Where the transverse walkway is less than 3 m wide the TGSIs may be reduced in accordance with AS 1428.4.1

Figure 17 — Location of ramp to prevent protrusion of handrails into a transverse path of travel other than at boundaries

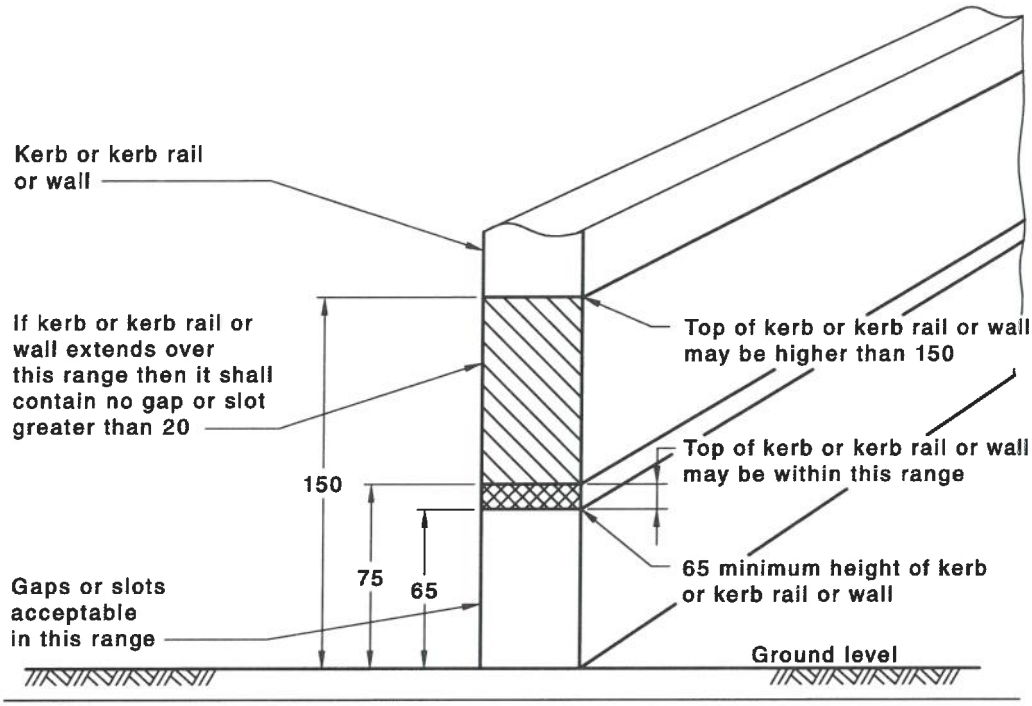
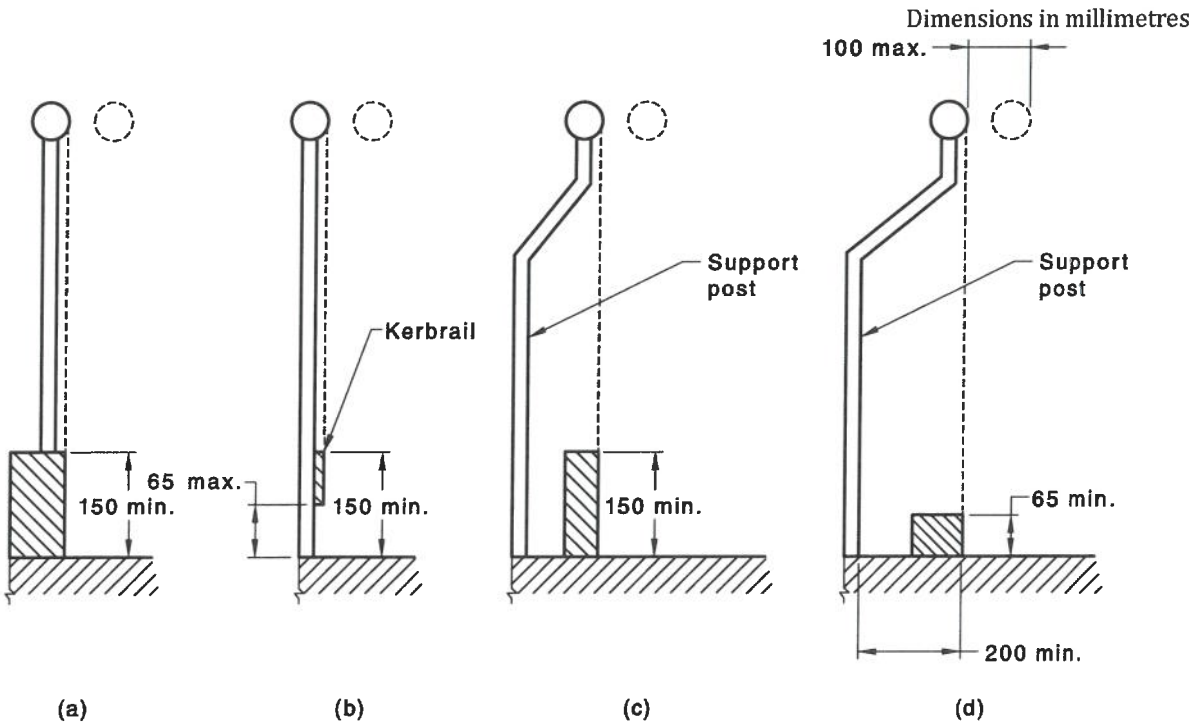


Figure 18 — Kerb



NOTE See Appendix A for further clarification

Figure 19 — Section showing location of kerb or kerb rail in relation to handrail with vertical support

7.4 Curved walkways, ramps, and landings

Curved ramps are defined as ramps with a maximum inside radius of 5 m. Curved ramps, walkways and landings shall be in accordance with the following:

(a) The gradient of curved ramps and walkways shall be in accordance with Figure 20.

(b) Landings shall be in accordance with Clause 7.8.

(c) The length of a curved ramp shall be measured horizontally along its centre-line.

(d) Curved ramps and walkways shall have a width of not less than 1 500 mm.

(e) Any crossfall shall be towards the centre of curvature.

(f) Curved walkways and ramps shall begin and terminate with 1 500 mm long straight landings which shall intersect with each other along the centre-line. Any required change in width shall be accommodated within the length of the landing.

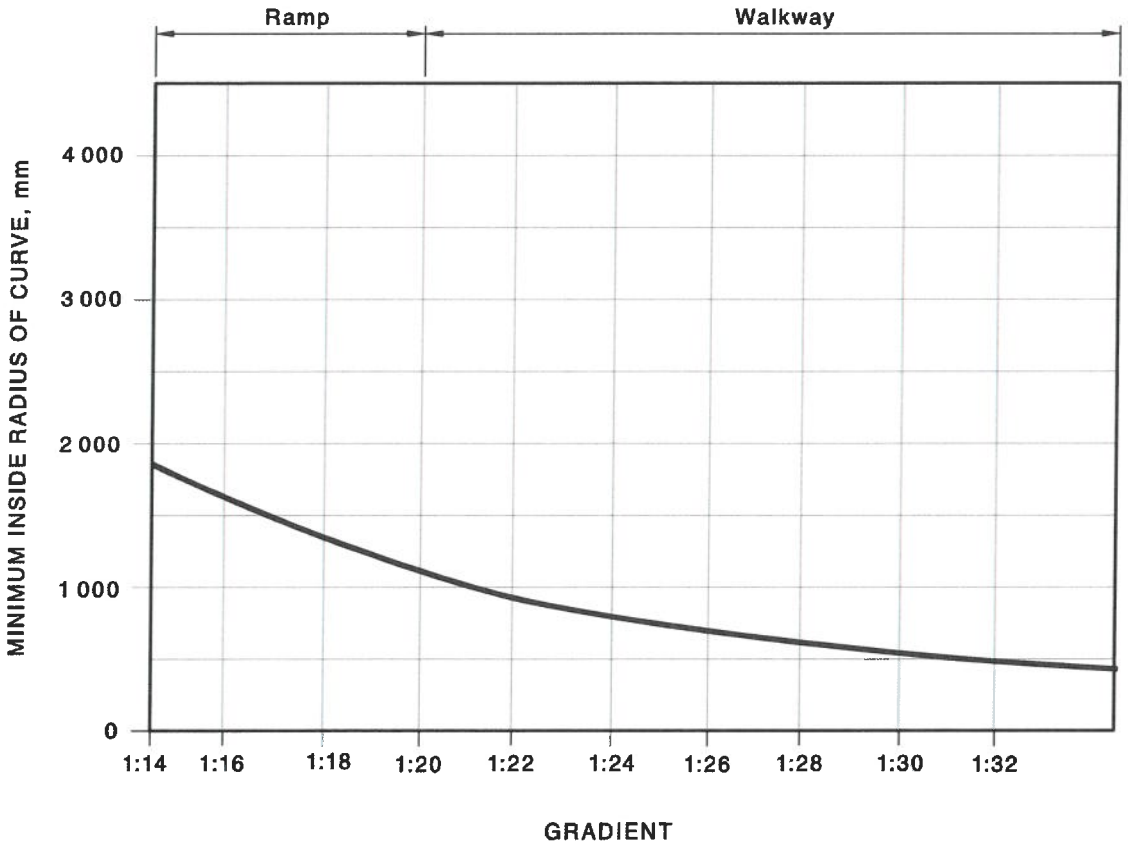


Figure 20 — Curved ramp and walkway gradients

7.5 Threshold ramps

Threshold ramps at doorways on a continuous path of travel shall have —

(a) a maximum rise of 35 mm;

(b) a maximum length of 280 mm;

(c) a maximum gradient of 1:8; and

(d) be located within 20 mm of the door leaf which it serves, as shown in Figure 21.

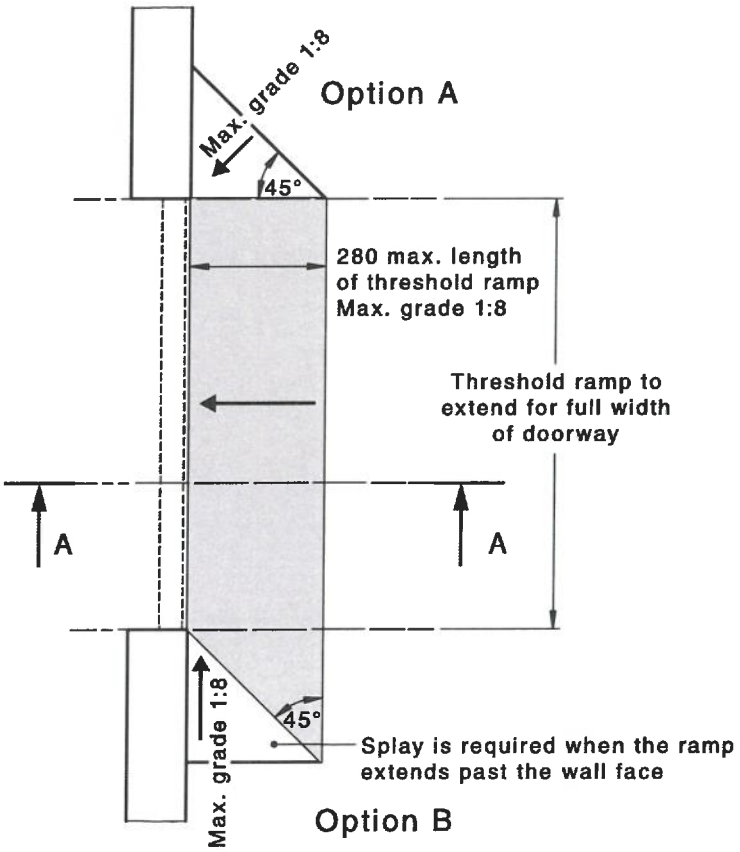
(e) sharp transition at top and bottom; and

(f) sharp transition at tapered or splayed edges.

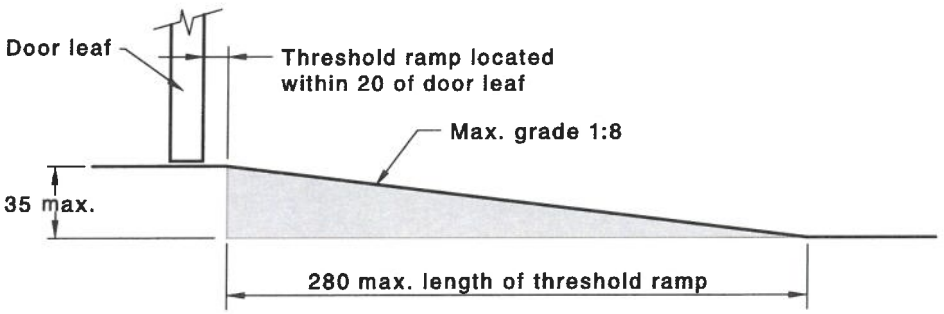
The edges of the threshold ramp shall be tapered or splayed at a minimum of 45° where the ramp does not abut a wall. Splay is required when the ramp extends past the wall face.

NOTE For door controls, see Clause 10.4.

Dimensions in millimetres



(a) PLAN VIEW (not to scale)



(b) SECTION A-A

Figure 21 — Threshold ramp

7.6 Step ramps

7.6.1 General

Step ramps shall have —

(a) a maximum rise of 190 mm;

(b) a length not greater than 1 900 mm; and

(c) a gradient not steeper than 1 in 10.

(d) top and bottom aligned at 90° to the path of travel;

(e) sharp transition at top and bottom; and

(f) sharp transition at tapered or splayed edges.

Step ramps shall be as shown in Figures 22(A) and 22(B), as applicable.

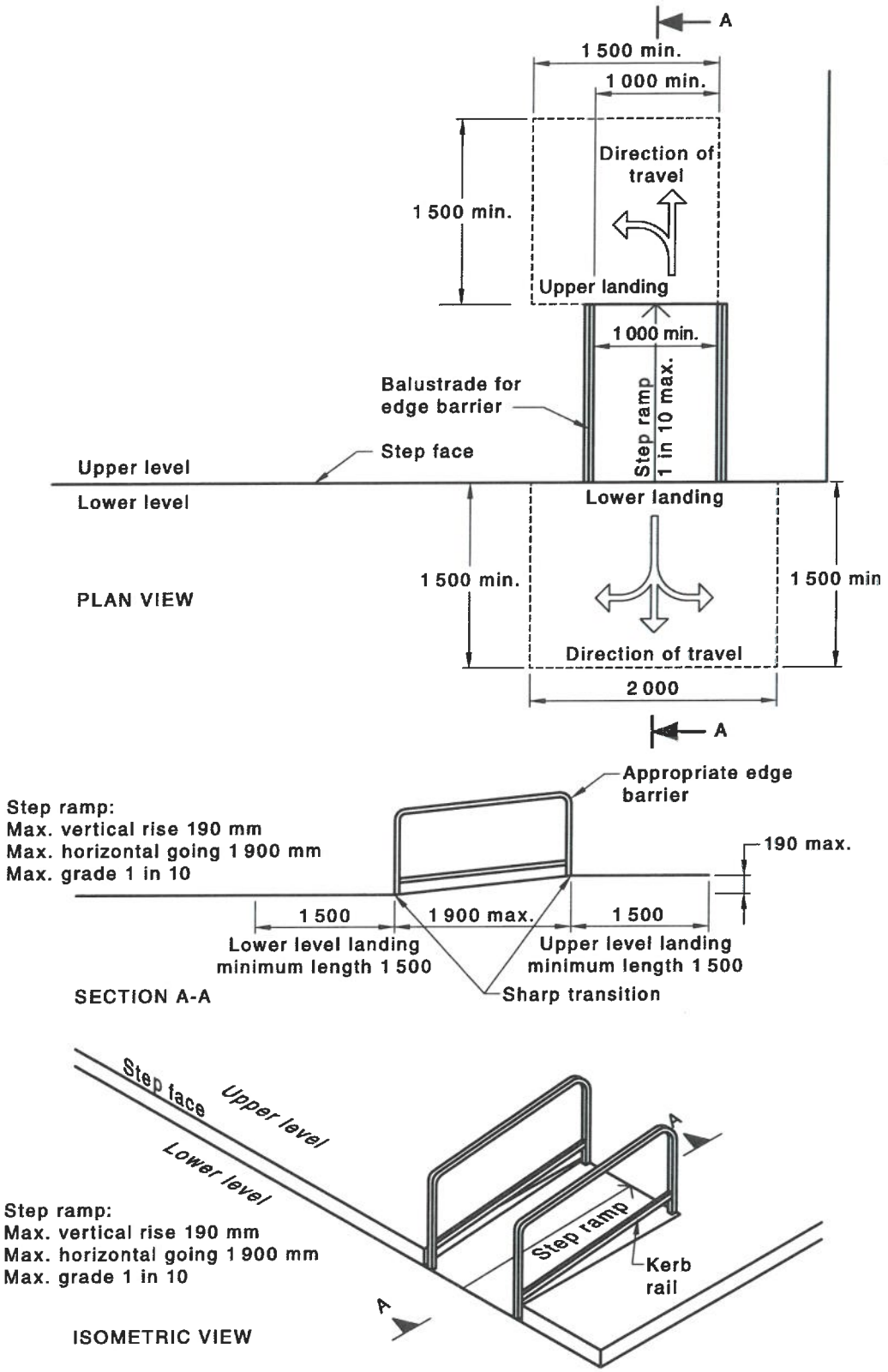
7.6.2 Edges to ramps

The edges of a step ramp shall be tapered or splayed at a minimum of 45° splay where the ramp does not abut a wall or where there is pedestrian cross-traffic. Otherwise, it shall be protected by a suitable barrier, as shown in Figure 22(B), such as —

(a) a wall, fence, balustrade or similar barrier; or

(b) where an open balustrade is provided a kerb or kerb rail shall be provided in accordance with Figures 18 and 19.

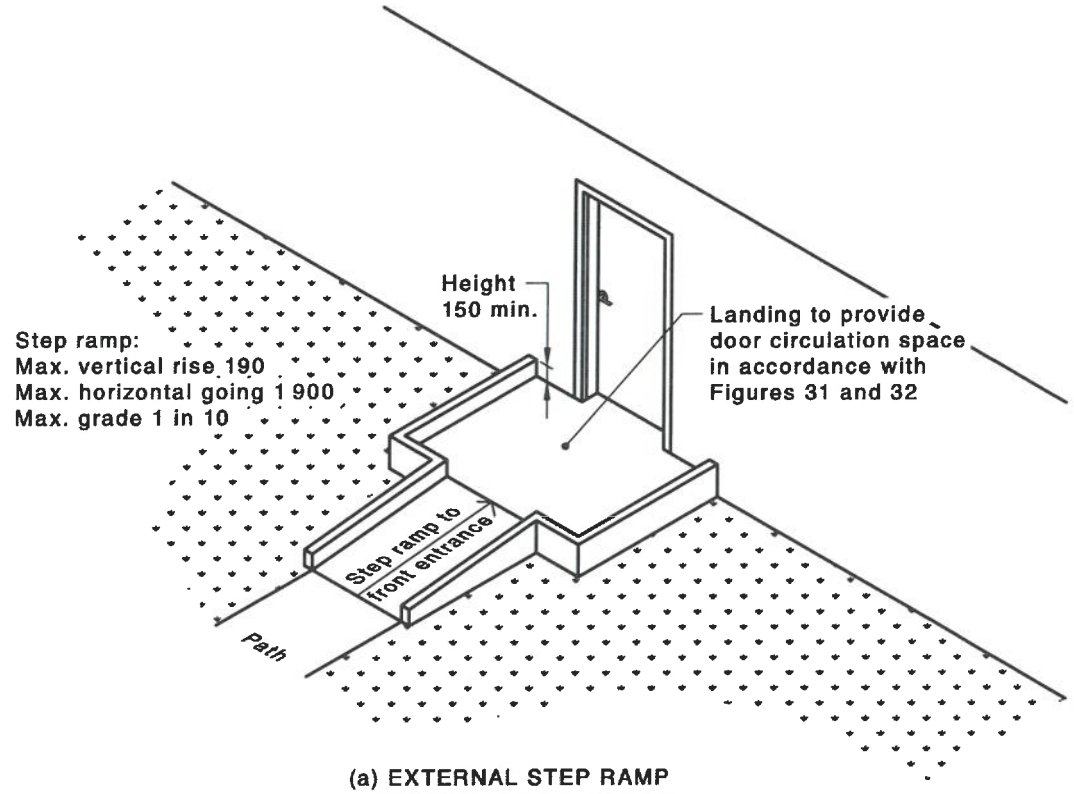
Dimensions in millimetres



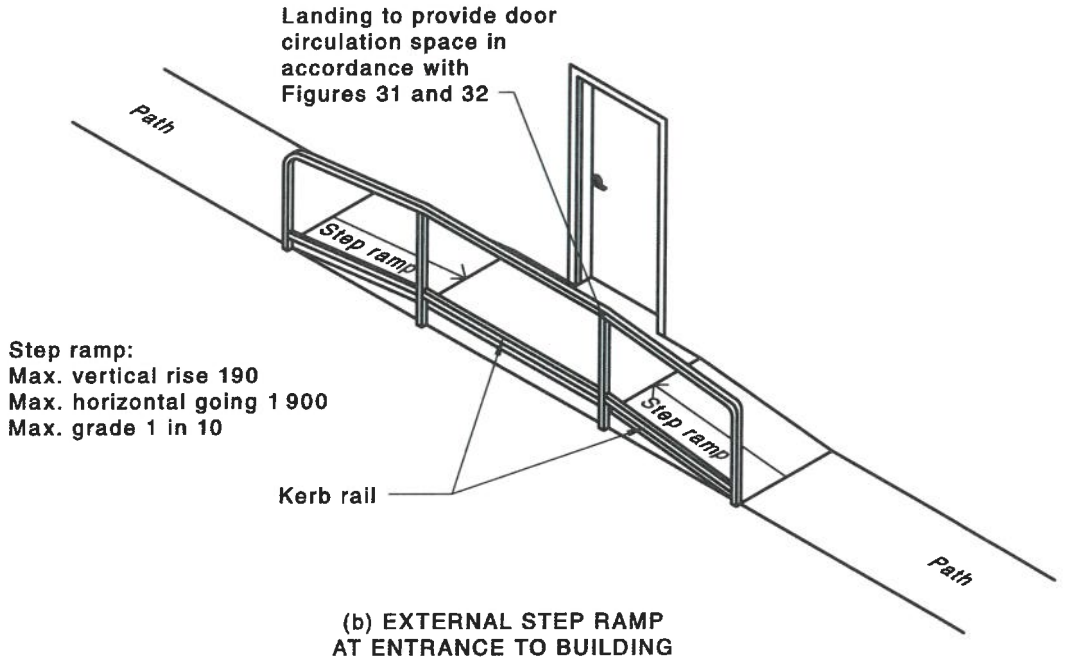
NOTE Where there is no turn involved, top and bottom landing may be reduced to a minimum of 1 200 mm in length.

Figure 22(A) — Step ramp — Inserted showing option of balustrade with kerb rail

Dimensions in millimetres



(a) EXTERNAL STEP RAMP
AT ENTRANCE TO BUILDING



(b) EXTERNAL STEP RAMP
AT ENTRANCE TO BUILDING

Figure 22(B) — External step ramps at entrance to building

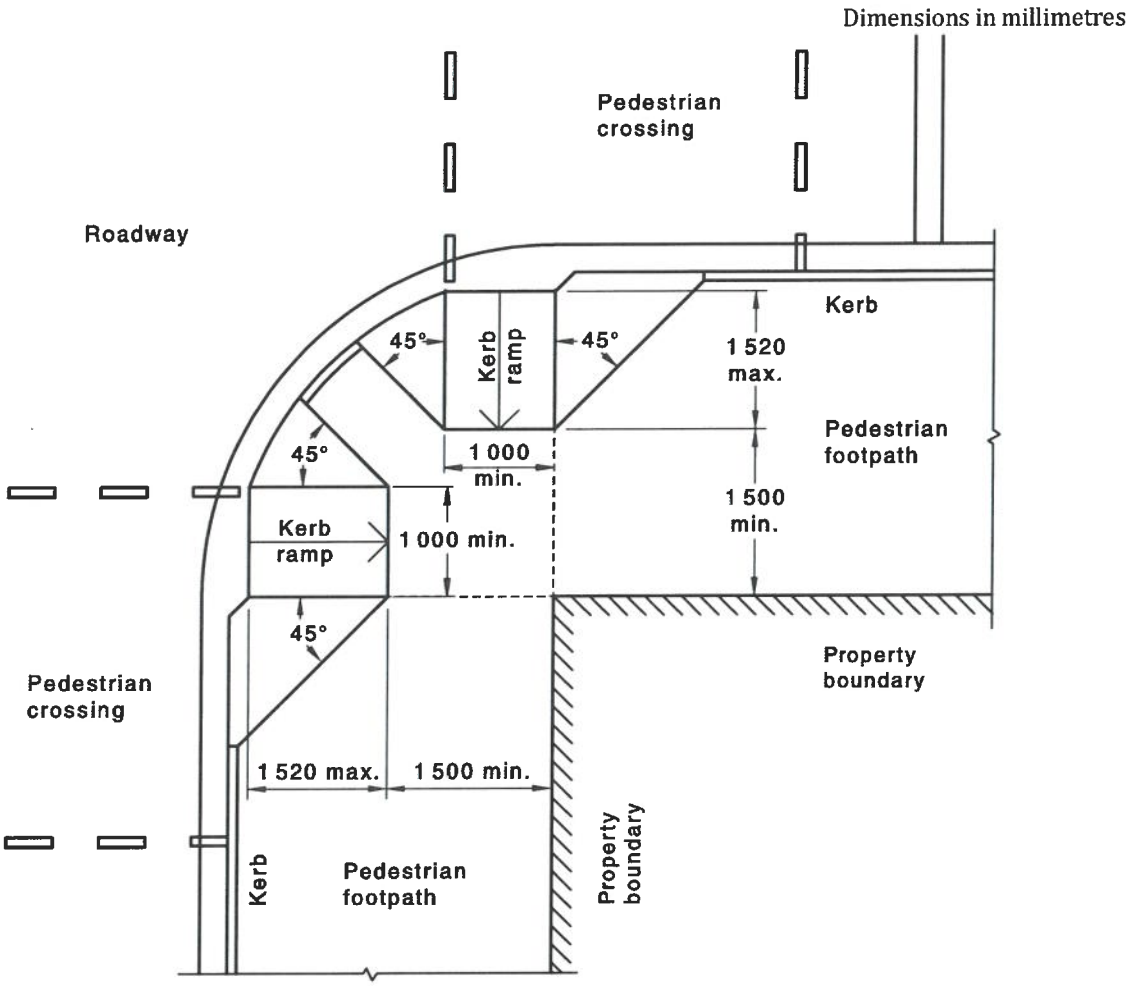
7.6.3 Finishes

Step ramps shall have a slip-resistant surface.

7.7 Kerb ramps

7.7.1 Alignment

Kerb ramps shall be aligned in the direction of travel and aligned with the kerb ramp on the opposite side of the crossing, as shown in Figures 23(A) and 23(B).



NOTE 1 Centre-line of kerb ramps and pedestrian refuges shall align across the road or vehicular driveway within the building/property allotment.

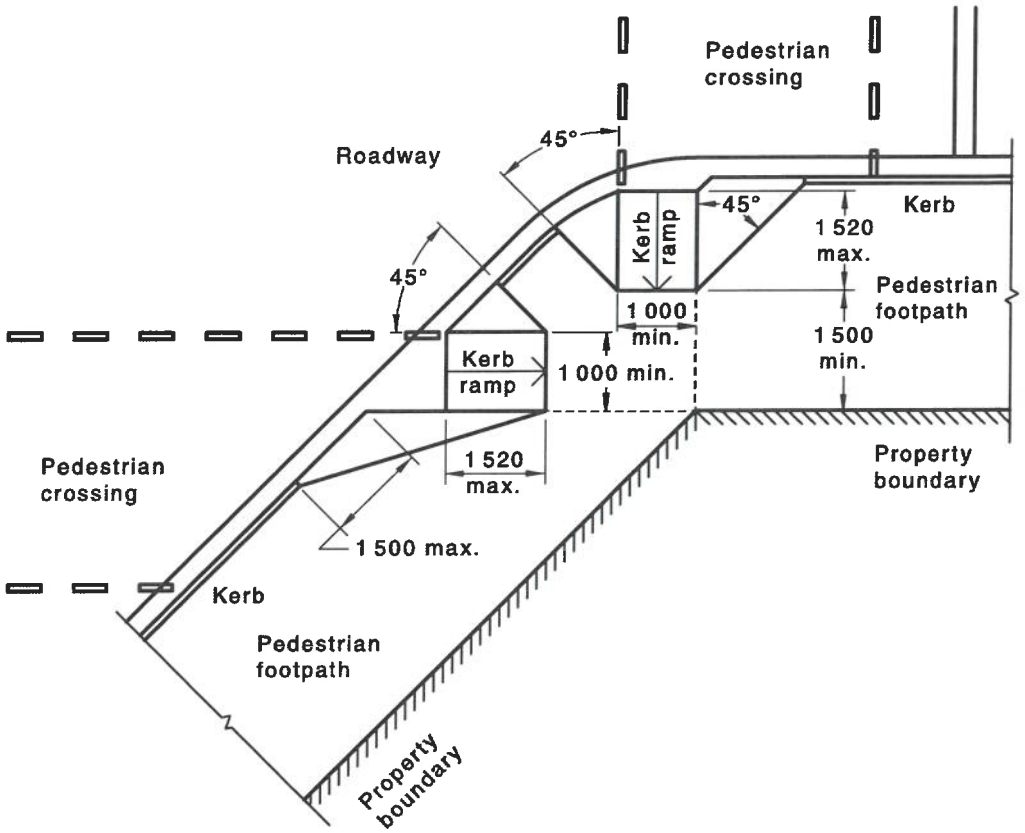
NOTE 2 Top and bottom of kerb ramps shall be aligned at 90° to path of travel.

NOTE 3 All planes of ramps and wings shall have sharp gradient transitions.

NOTE 4 For requirements for tactile ground surface indicators see AS 1428.4.1.

NOTE 5 For requirements for pedestrian lights and push-button assemblies see AS 1742.14.

Figure 23(A) — 90° road intersection



NOTE 1 Centre-line of kerb ramps and pedestrian refuges shall align across the road or vehicular driveway within the building/property allotment.

NOTE 2 Top and bottom of kerb ramps shall have a sharp gradient transition.

NOTE 3 For requirements for tactile ground surface indicators see AS 1428.4.1.

NOTE 4 For requirements for pedestrian lights and push-button assemblies see AS 1742.14.

NOTE 5 Top and bottom of kerb ramps shall be aligned at 90° to path of travel.

NOTE 6 Edge of ramps shall have a sharp transition at the splay to ensure that the width of the path of travel is not compromised by curving the transition.

Figure 23(B) — Alignment of kerb ramps — 90° road intersection

7.7.2 Profile

Kerb ramps shall have —

(a) a maximum rise of 190 mm;

(b) a length not greater than 1 520 mm; and

(c) a gradient not steeper than 1 in 8, located within or attached to a kerb.

The profile of ramps shall have sharp transitions and be in accordance with the following:

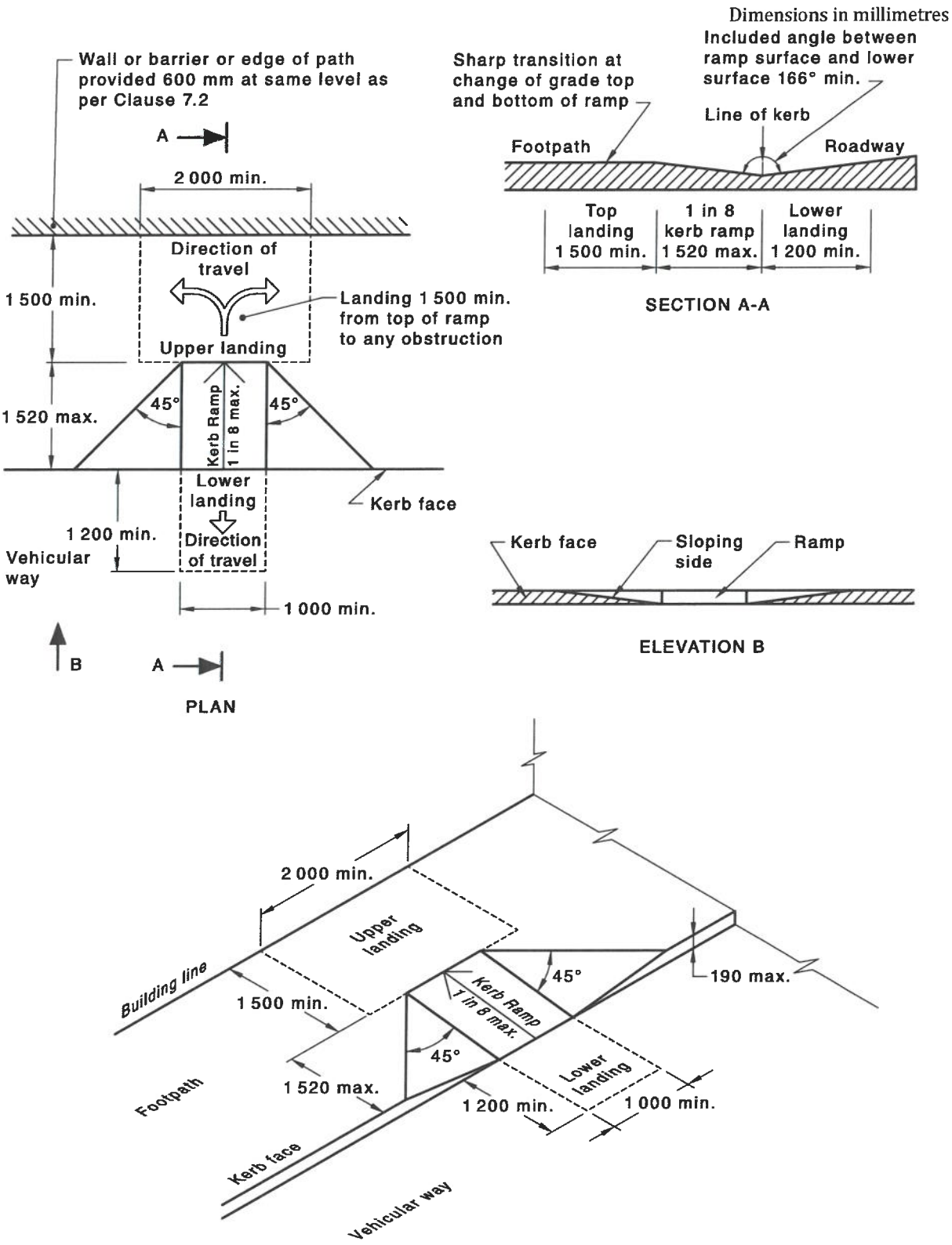
(i) The design and construction of kerb ramps shall be as shown in Figures 24(A), 24(B) and 24(C).

(ii) The sloping sides of a kerb ramp shall be tapered or splayed as indicated in Figures 24(A) and 24(B).

(iii) The angle at the base of the kerb ramp shall be a minimum of 166° as shown in Figures 24(A) and 24(B).

7.7.3 Finishes

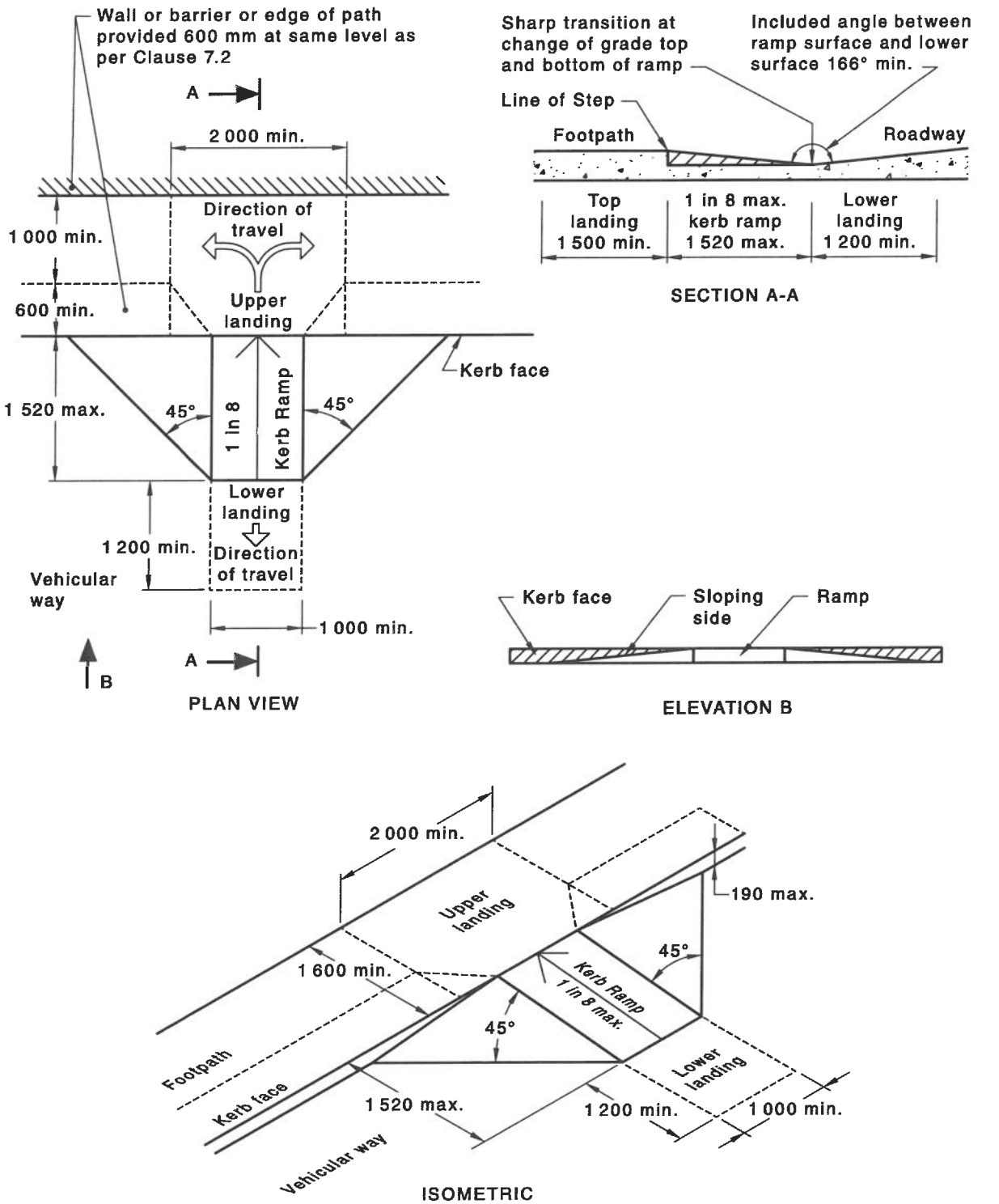
Kerb ramps shall have a slip-resistant surface.



NOTE Where there is no turn involved, top landing may be reduced to a minimum of 1 200 mm in length.

Figure 24(A) — Inserted kerb ramp

Dimensions in millimetres



NOTE Where there is no turn involved, top landing may be reduced to a minimum of 1 200 mm in length.

Figure 24(B) — Attached kerb ramp

Dimensions in millimetres

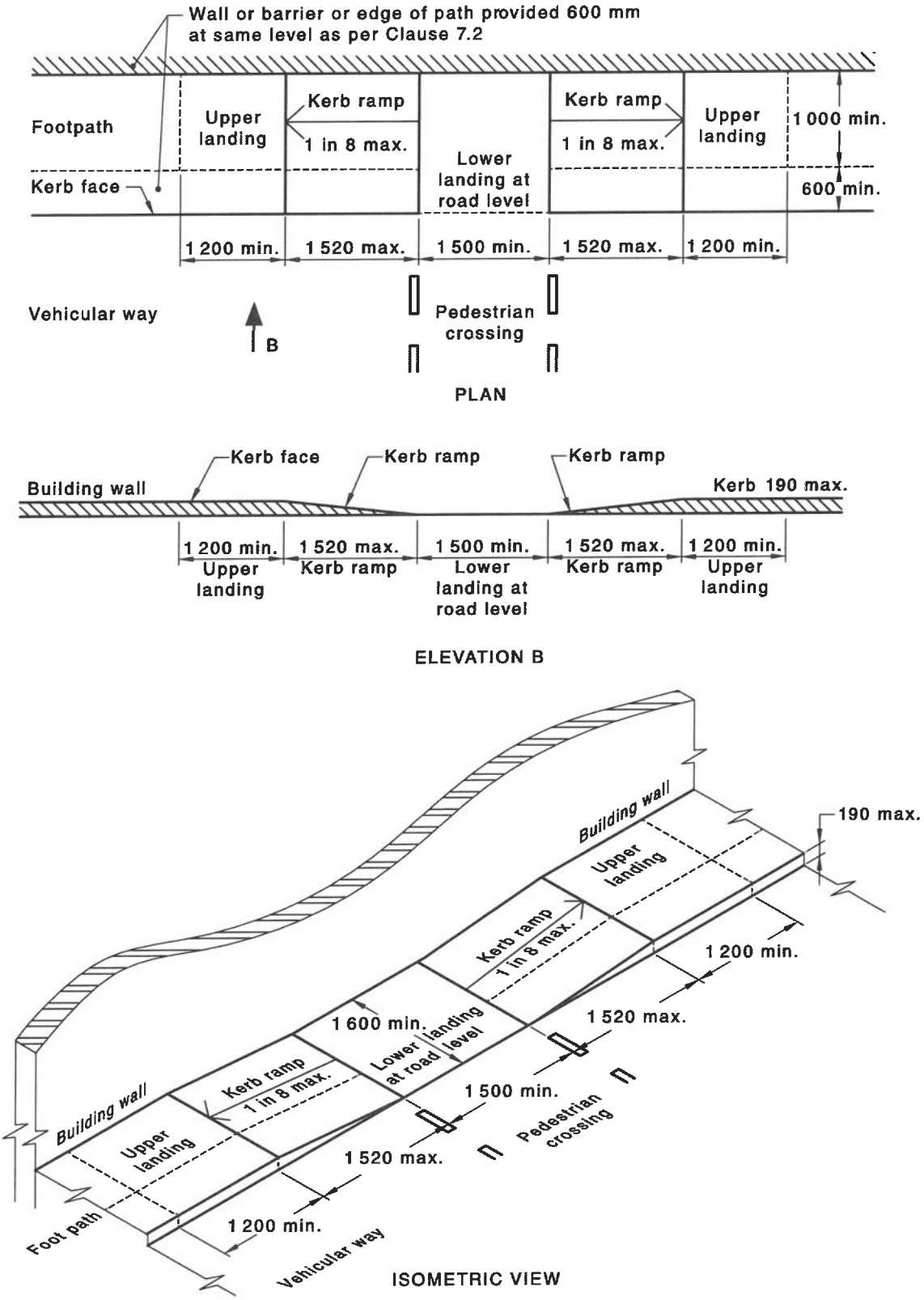


Figure 24(C) — In line kerb ramps — Narrow footpaths

7.8 Landings

7.8.1 Walkways and ramps

The length of landings at walkways and ramps shall be in accordance with one of the following:

(a) Where there is no change in direction, the length shall be not less than 1 200 mm, as shown in Figure 25(A).

(b) Where there is a change of direction not exceeding 90°, the landing shall be not less than 1 500 mm long and 1 500 mm wide. The internal corner may be truncated as shown in Figure 25(B). Where it is truncated the truncation shall not reduce the clear width of the accessways.

(c) For a 180° turn, the landing shall be as shown in Figure 25(C).

7.8.2 Step ramps

The length of landings at step ramps shall be not less than 1 200 mm in the direction of travel, as shown in Figures 22(A) and 22(B).

Where a change in direction is required, the length of step ramp landings shall be a minimum of 1 500 mm, as shown in Figure 22(A).

Where doorways are at landings, the dimensions of the landings shall be in accordance with the requirements of Clause 10.3 for circulation spaces at doorways shown in Figure 25(D).

7.8.3 Kerb ramps

The length of landings at kerb ramps shall be not less than 1 200 mm in the direction of travel.

Where a "T" junction occurs, the kerb ramp landing shall be a minimum of 1 500 mm × 2 000 mm, as shown in Figure 24(B).

Where a single change in direction is required, the ramp landings shall be a minimum of 1 500 mm × 1 500 mm.

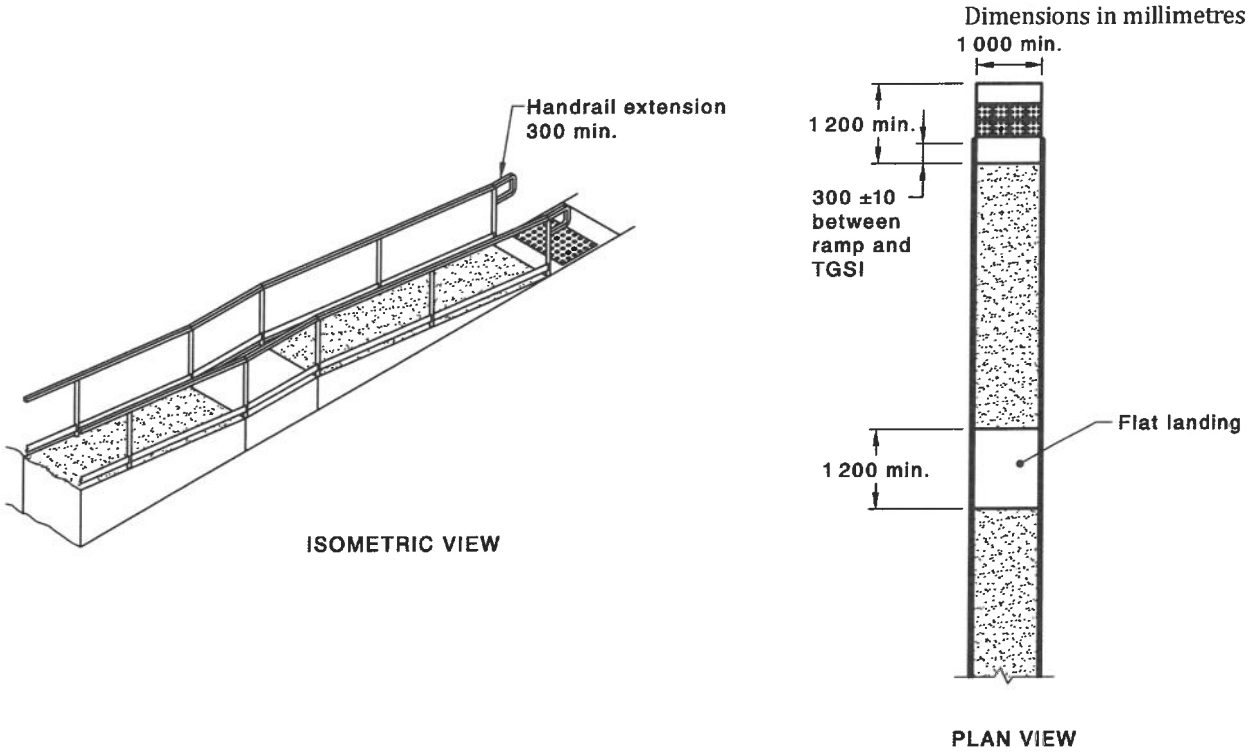


Figure 25(A) — Ramps and landings — With no change in direction

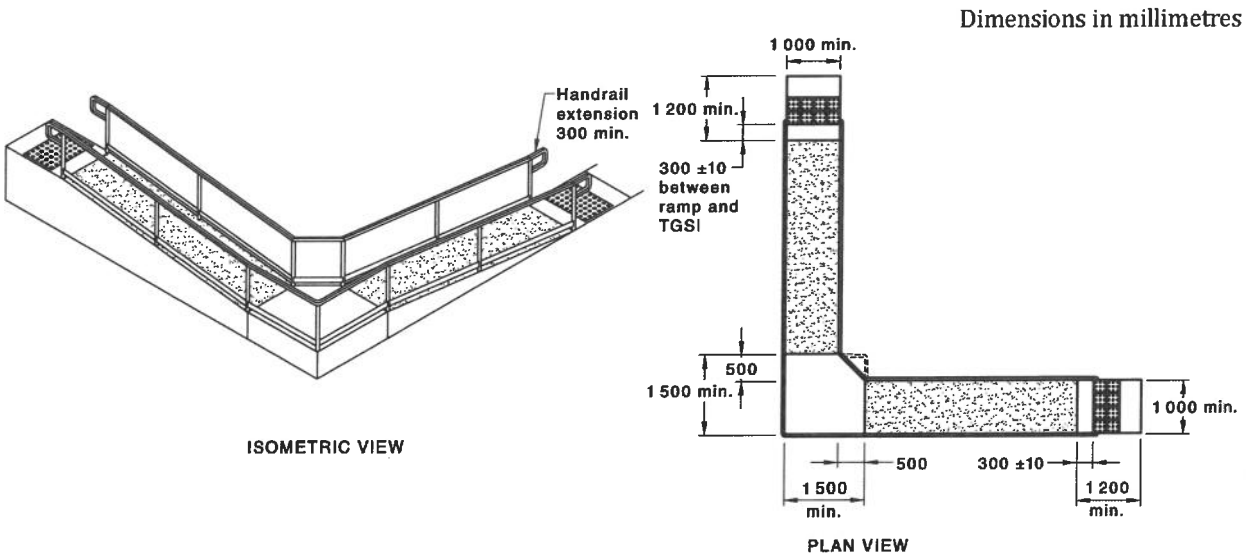


Figure 25(B) — Ramps and landings — 90° landing — Internal

Dimensions in millimetres

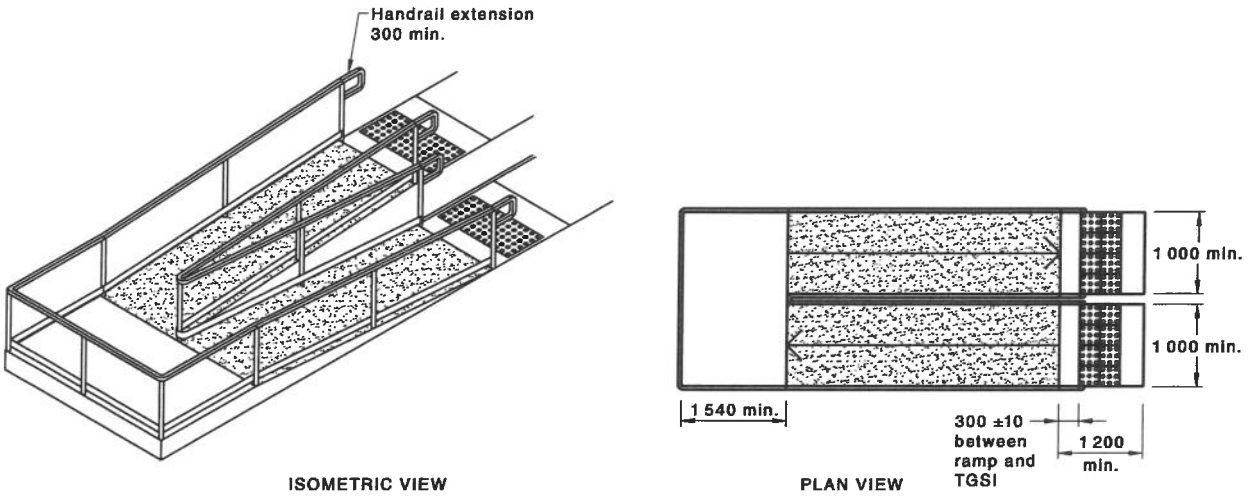


Figure 25(C) — Ramps and landings — 180° landing

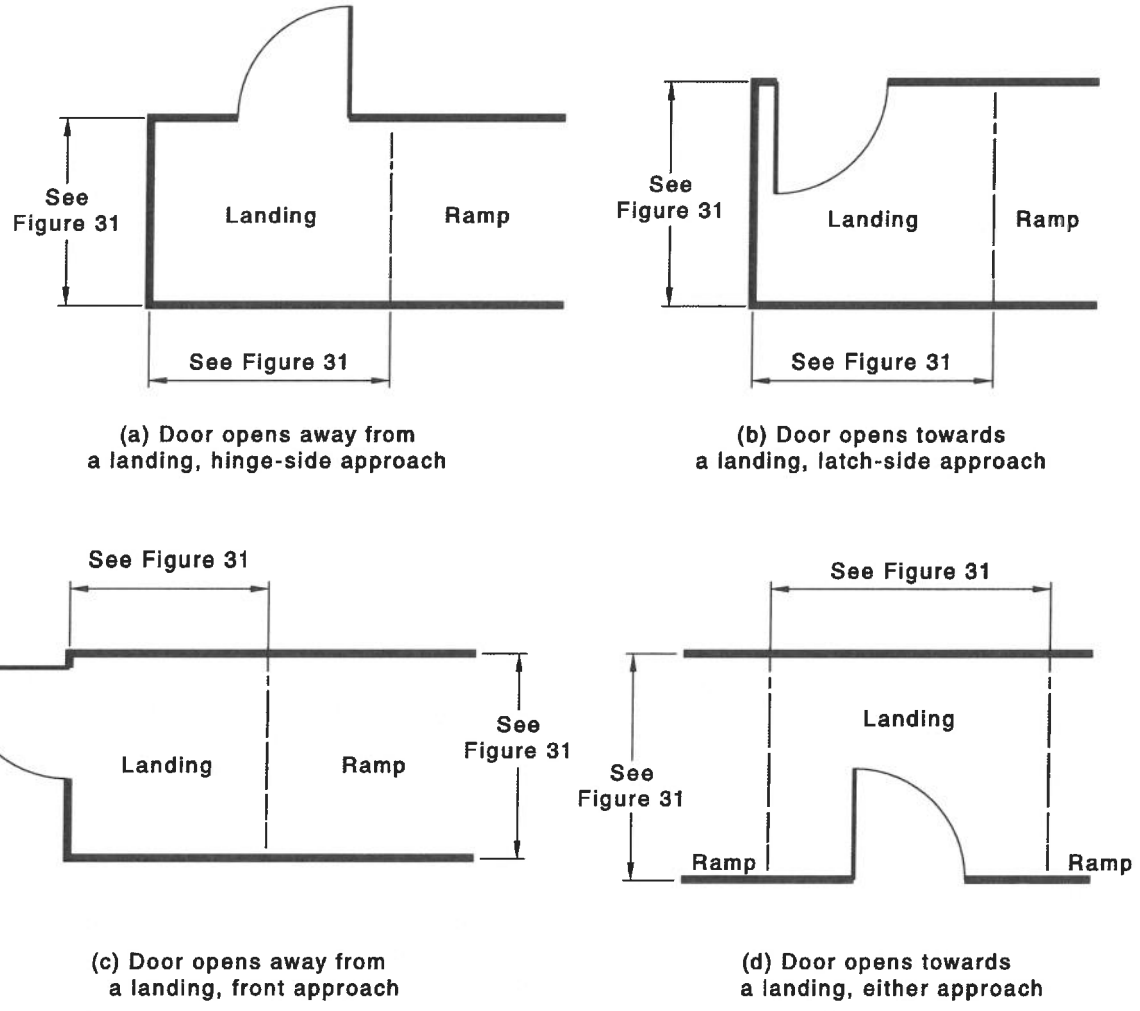


Figure 25(D) — Doorways at landings

Section 8 Stairways

8.1 Stair construction

Where required, stairs shall be constructed as follows:

(a) Where the intersection is at the property boundary, the stair shall be set back by a minimum of 900 mm so that the handrail (in accordance with Clause 9) and TGSIs do not protrude into the transverse path of travel, as shown in Figure 26(A).

(b) Where the intersection is not at the property boundary, the stair shall be located so that the handrail does not protrude into the transverse accessway. See Figure 26(B).

NOTE 1 Examples of stair handrail terminations are given in Figures 26(C) and 26(D).

(c) Stairs shall have opaque risers.

(d) Stair nosings shall not project beyond the face of the riser and the riser may be vertical or have a splay backwards up to a maximum 25 mm, as shown in Figures 27(A) and 27(B).

(e) Stair nosing profiles shall —

(i) have a sharp intersection;

(ii) be rounded up to 5 mm radius; or

(iii) be chamfered up to 5 mm × 5 mm.

(f) At the nosing, each tread shall have a single strip (not multistrip) not less than 50 mm and not more than 75 mm deep across the full width of the path of travel. The single strip shall be of a continuous colour. The strip may be set back a maximum of 15 mm from the front of the nosing. The strip shall have a minimum luminance contrast of 30 % to the background (see Figure 27(C)). Where the luminous contrasting strip is affixed to the surface of the tread, any change in level shall be in accordance with Figure 6(a).

NOTE 2 See Appendix B for information on the determination of luminance contrast.

(g) Where the luminance contrasting strip is not set back from the front of the nosing then any area of luminance contrast shall not extend down the riser more than 10 mm.

(h) TGSIs shall be installed in accordance with AS 1428.4.1.

Dimensions in millimetres

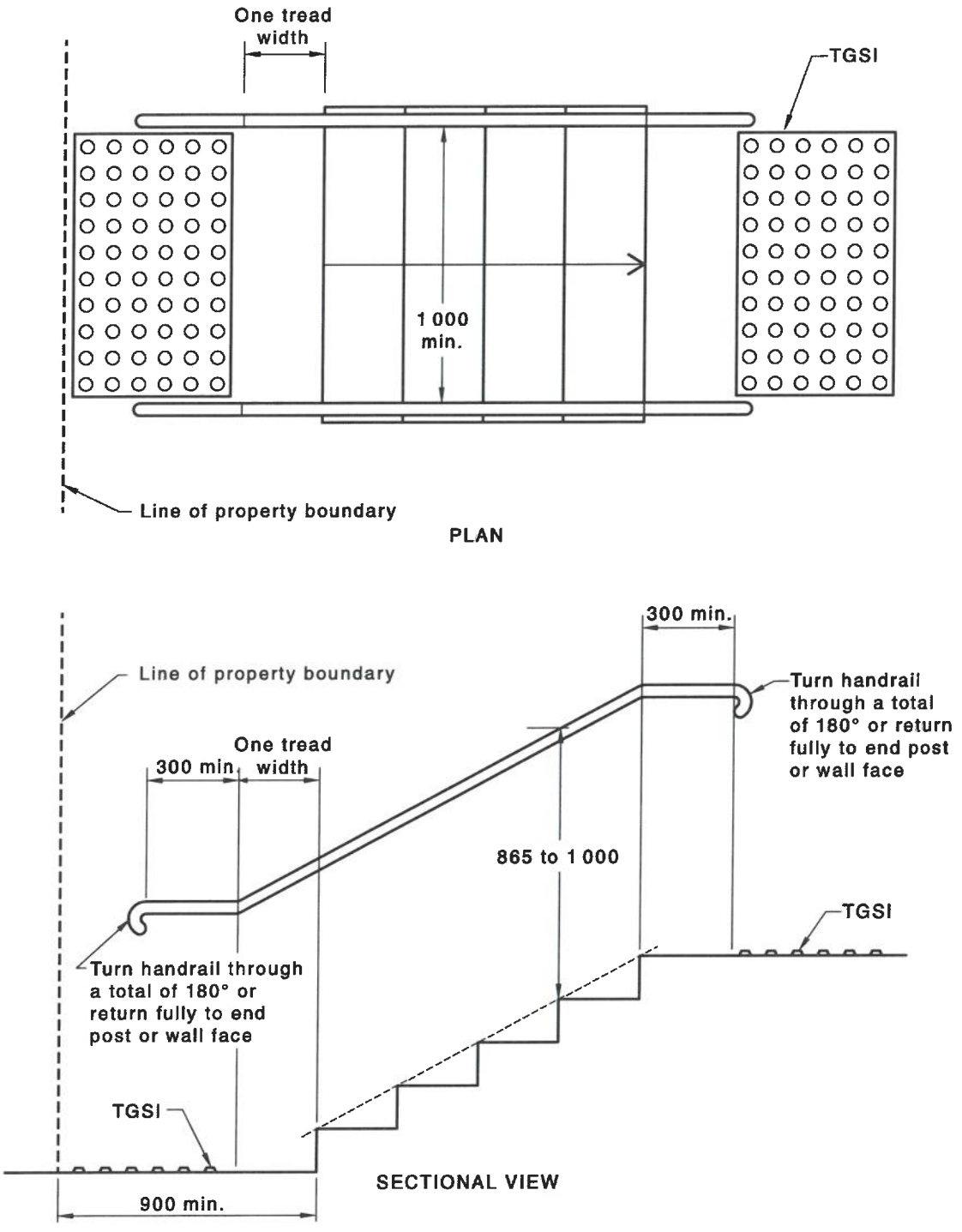


Figure 26(A) — Stairway location and handrail extensions at boundary

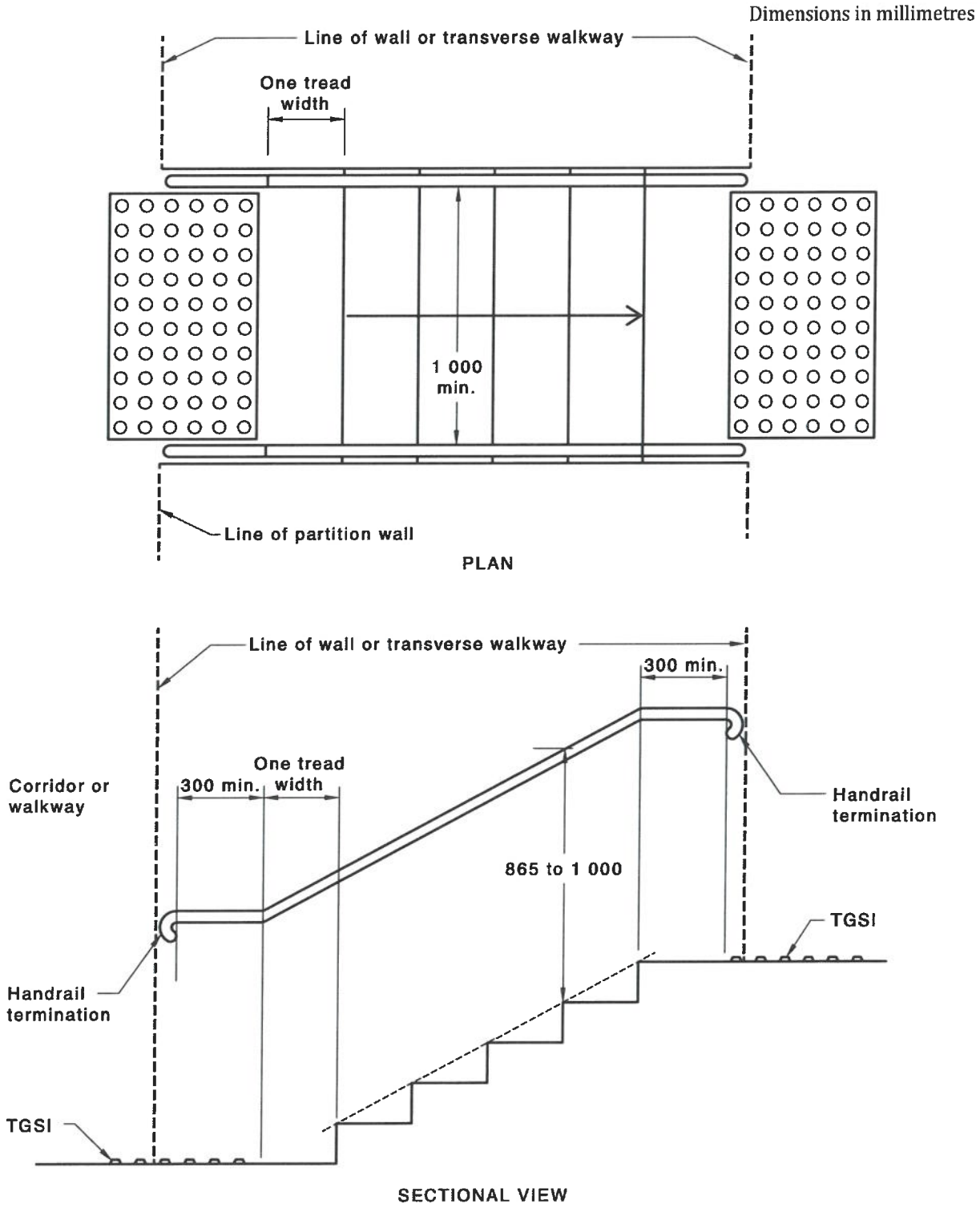
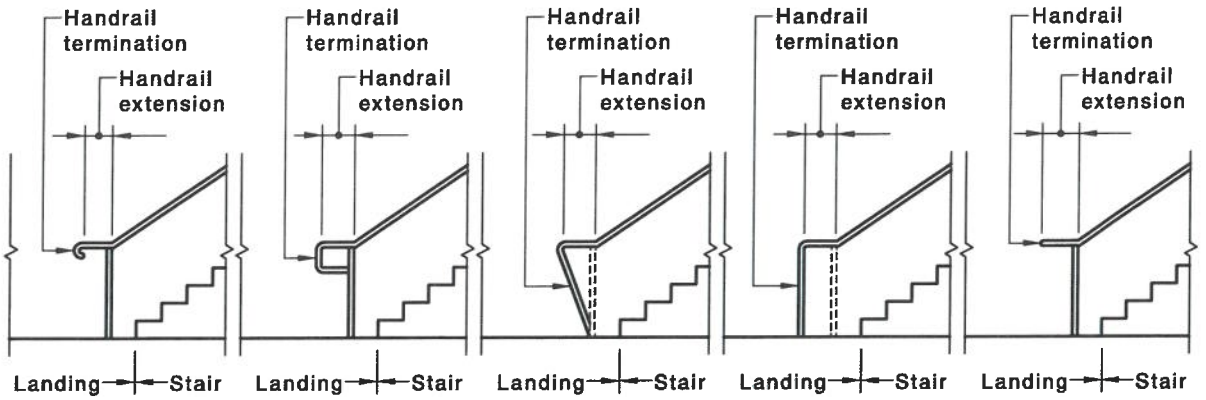
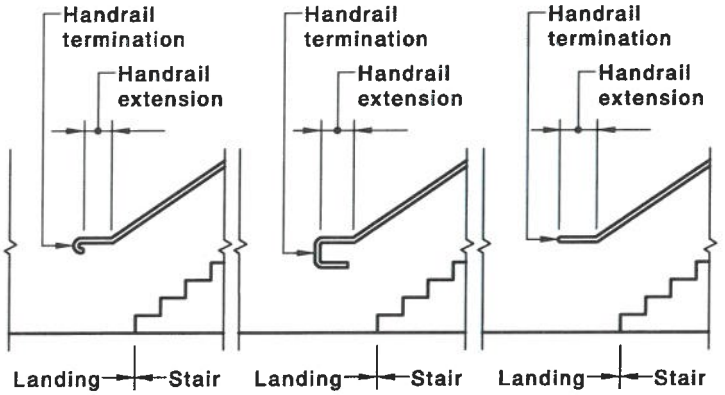


Figure 26(B) — Stairway location and handrail extensions at end of stairway other than at line of boundary



(a) Examples of post mounted handrails



(b) Examples of wall mounted handrails

Figure 26(C) — Stair handrails — Examples of handrail terminations

Dimensions in millimetres

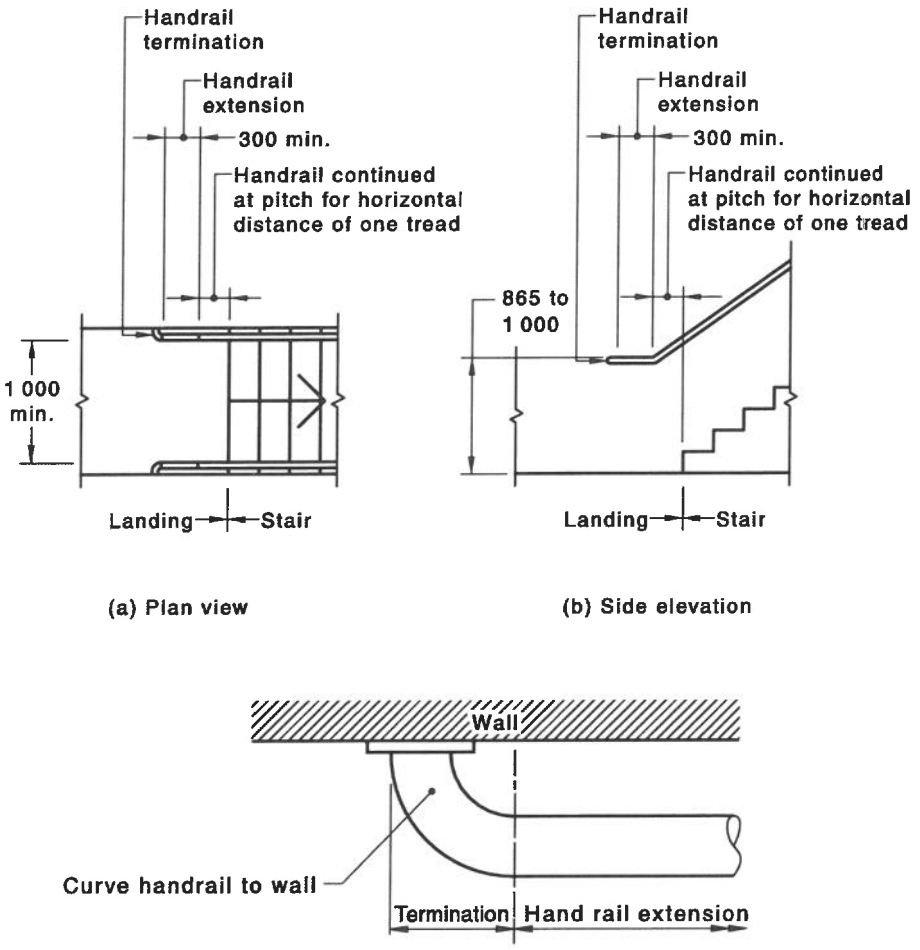
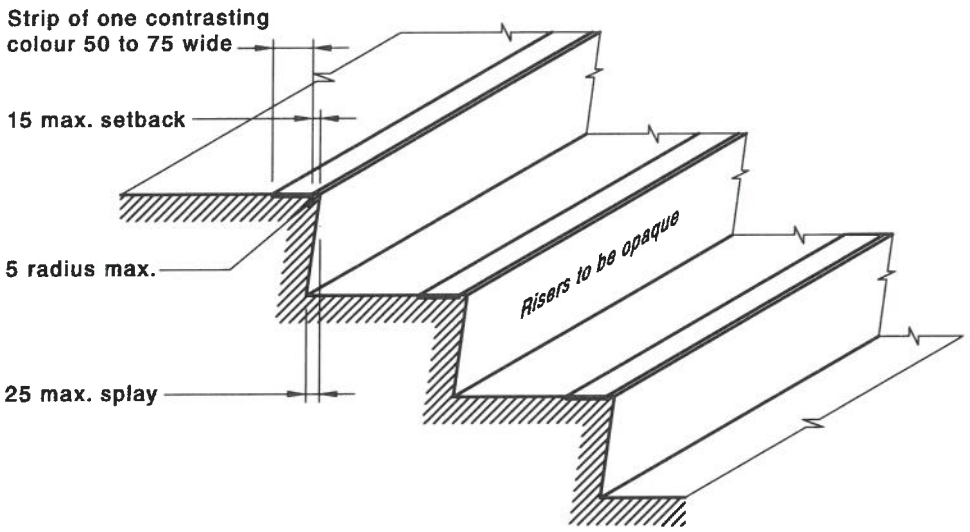


Figure 26(D) — Example of detail for handrails terminated by turning horizontally through 90° to the wall

Dimensions in millimetres



NOTE A chamfered nosing 5 × 5 mm may be used.

Figure 27(A) — Typical stair nosing profile with nosing strip

Dimensions in millimetres

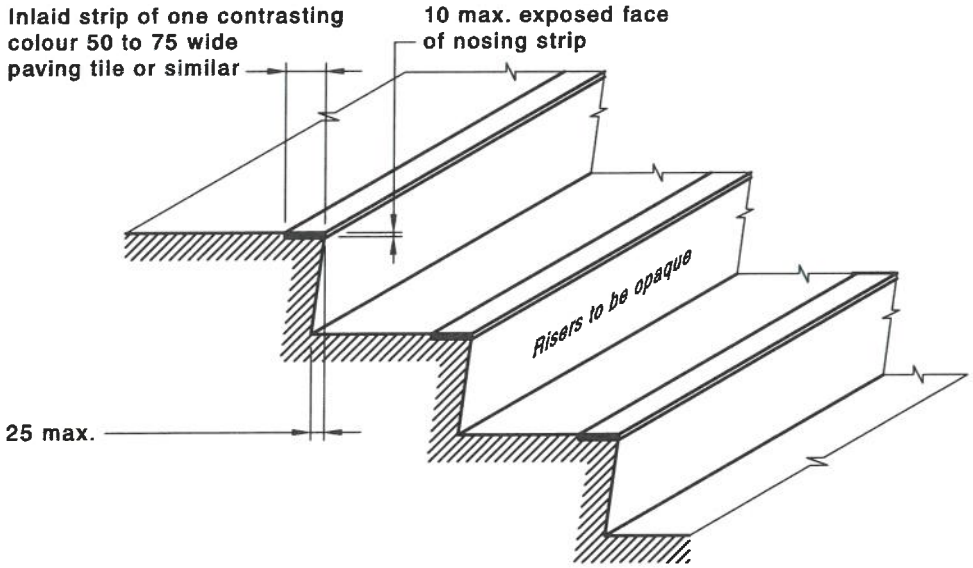


Figure 27(B) — Typical stair nosing profile with exposed nosing strip

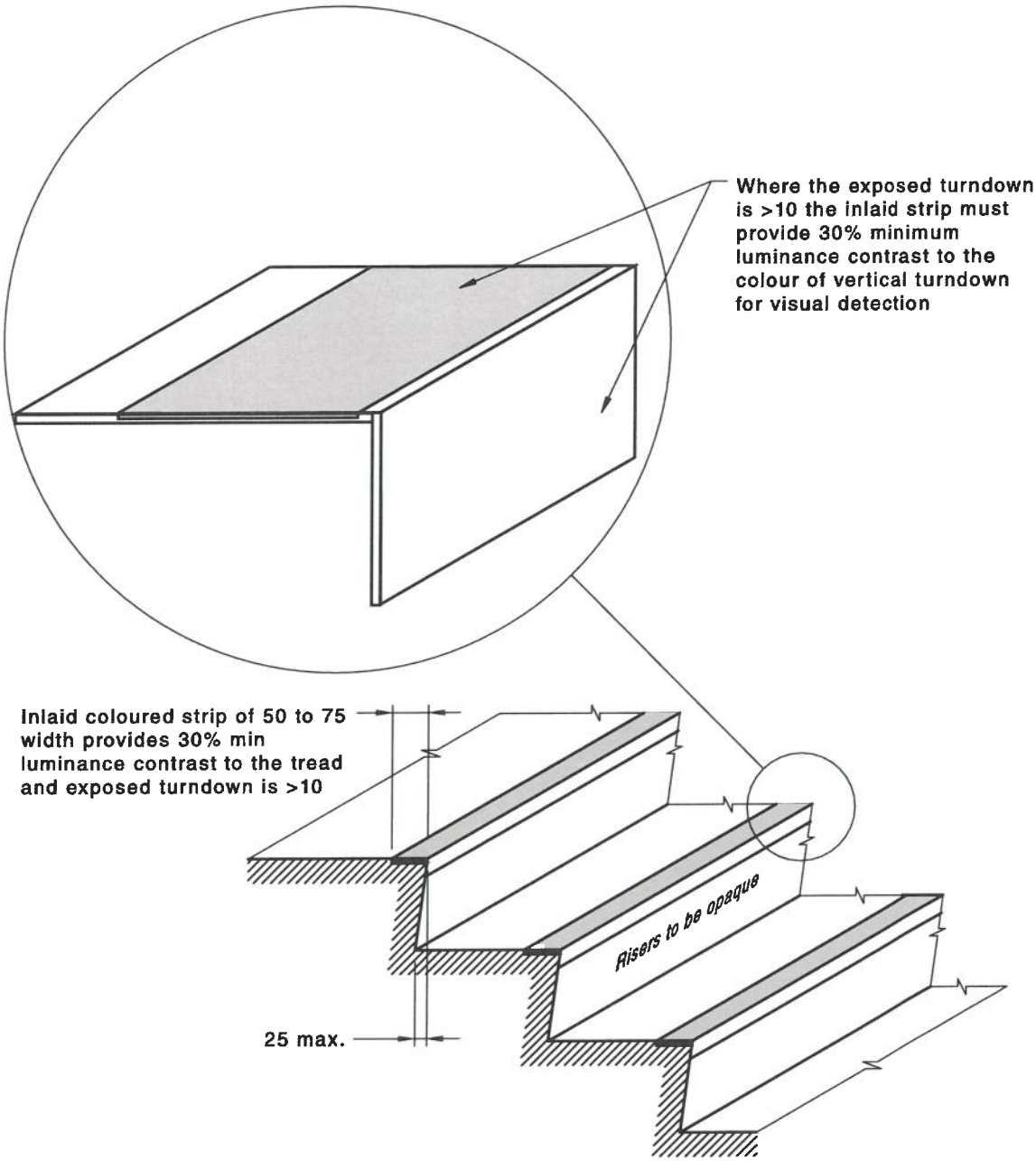


Figure 27(C) — Typical stair nosing profile

8.2 Stairway handrails

Handrails shall be continuous throughout the stair flight and, where practicable, around landings (see Figure 28) and have no obstruction on or above up to a height of 600 mm and as follows:

(a) The design and construction of handrails shall be in accordance with Clause 9.

(b) Handrails shall be installed on both sides of the stairs and as shown in Figures 26(A) and 26(B).

(c) Handrails shall have no vertical sections and shall follow the angle of the stairway nosings, as shown in Figure 28 (a).

(d) **Where a handrail terminates at the bottom of a flight of stairs, the handrail shall extend at least one tread depth parallel to the line of nosings plus minimum of 300 mm horizontally** from the last riser (see Figure 28 (a)).

(e) **The handrail shall extend a minimum of 300 mm horizontally past the nosing on the top riser.**

(f) **Where the handrail is continuous, the 300 mm extension is not required in the inner handrail** at intermediate landings as shown in Figure 28 (b).

(g) The dimensions indicating the heights of handrails shall be taken vertically from the nosing of the tread to the top of the handrail or from the landing to the top of the handrail and where the handrail continues across a landing the height may vary in accordance with Clause 9(e).

Dimensions in millimetres

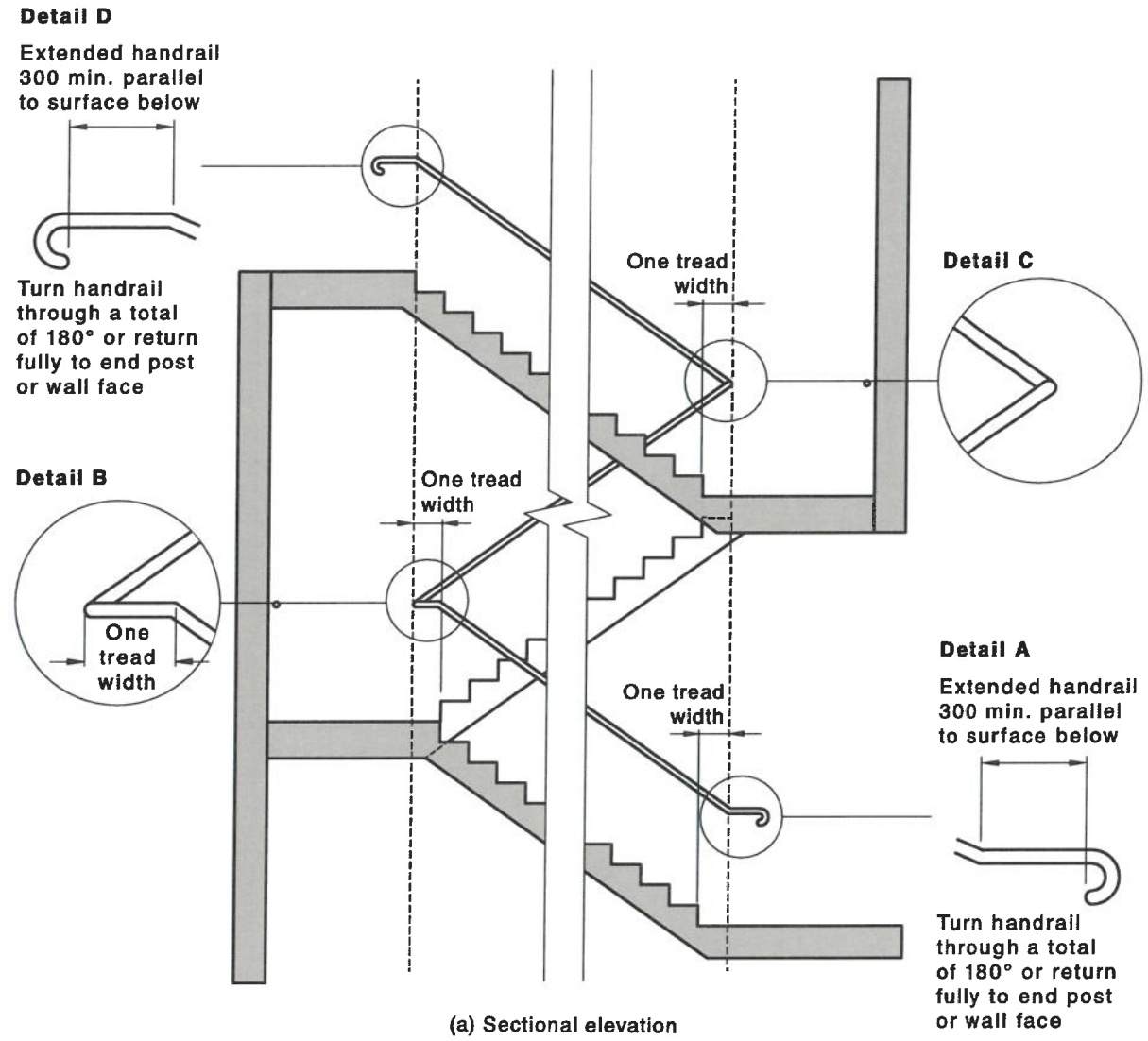


Figure 28 — Handrails to stairs with intermediate landings

Section 9 Handrails

The design and construction of handrails shall be in accordance with the following:

NOTE Handrails include any extensions.

(a) Handrails and balustrades shall not encroach into required circulation spaces.

(b) The cross-section of handrails shall be circular or elliptical, not less than 30 mm or greater than 52 mm in height or width for not less than 270° around the uppermost surface as shown in Figure 29 (a) and (b). Elliptical handrails shall have the greater dimension in the horizontal axis as shown in Figure 29 (b).

(c) To reduce the likelihood of injury, exposed corners at edges and corners of handrails shall have a radius of not less than 5 mm.

(d) The top of handrails shall be not less than 865 mm or more than 1 000 mm above the nosing of stairway tread or the plane of the finished floor of the walkway, ramp or landing.

(e) The height of the top of the handrail, measured in accordance with Item (d), shall be consistent through the ramp (or stairs) and any landings. The height of the handrail may vary across landings under the following circumstances:

(i) At a stairway handrail extension

(ii) Where a handrail transitions between flights or to a balustrade

(iii) Construction tolerance of up to 10 mm

(f) If a balustrade is required at a height greater than the handrail, both shall be provided.

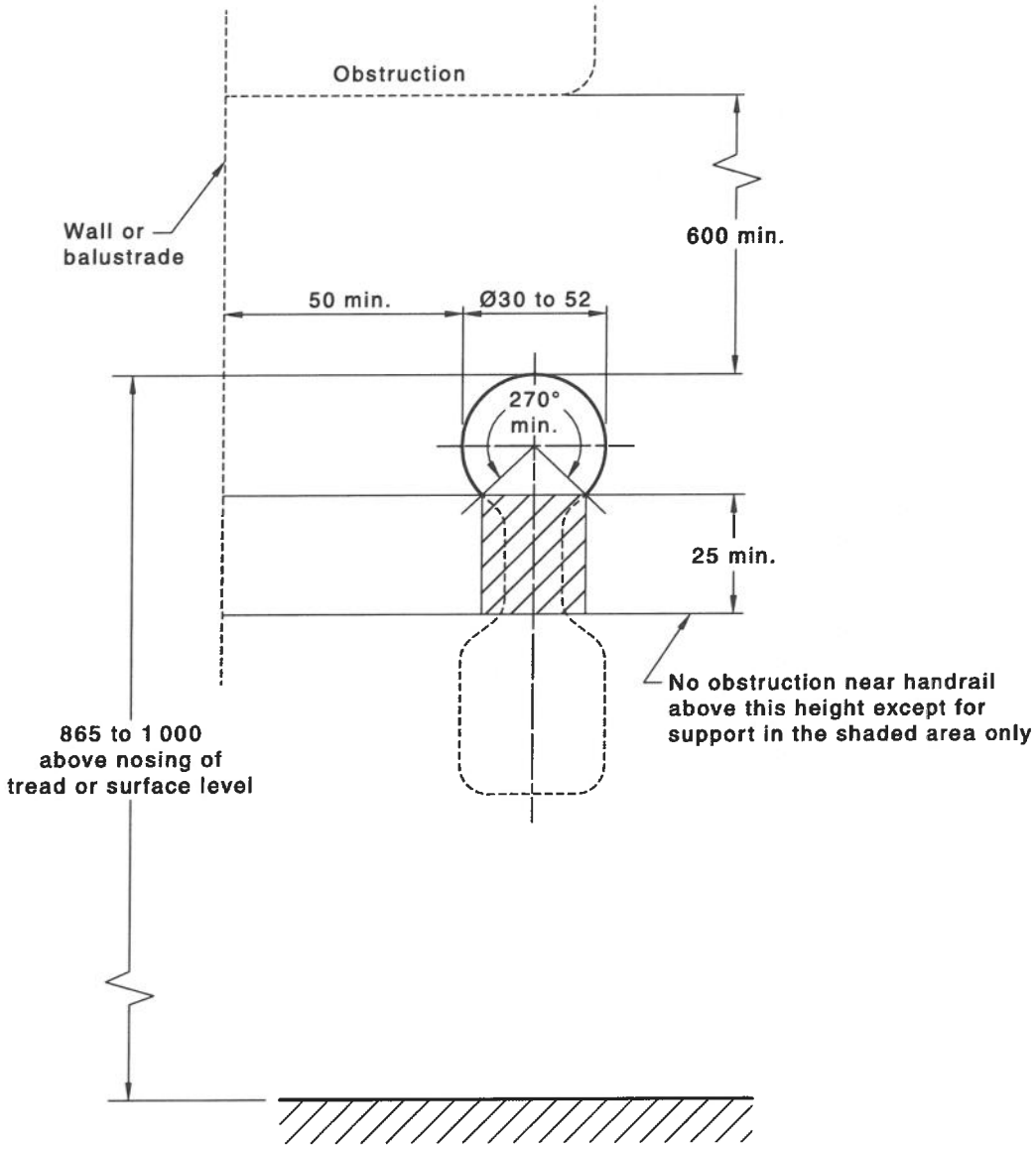
(g) Handrails shall be securely fixed and rigid, and their ends shall be turned through a total of 180°, or to the ground, or returned fully to end post or wall face, as shown in Figures 26(C) and 26(D).

(h) The clearance between a handrail and an adjacent wall surface or other obstruction shall be not less than 50 mm. This clearance shall extend above the top of the handrail by not less than 600 mm.

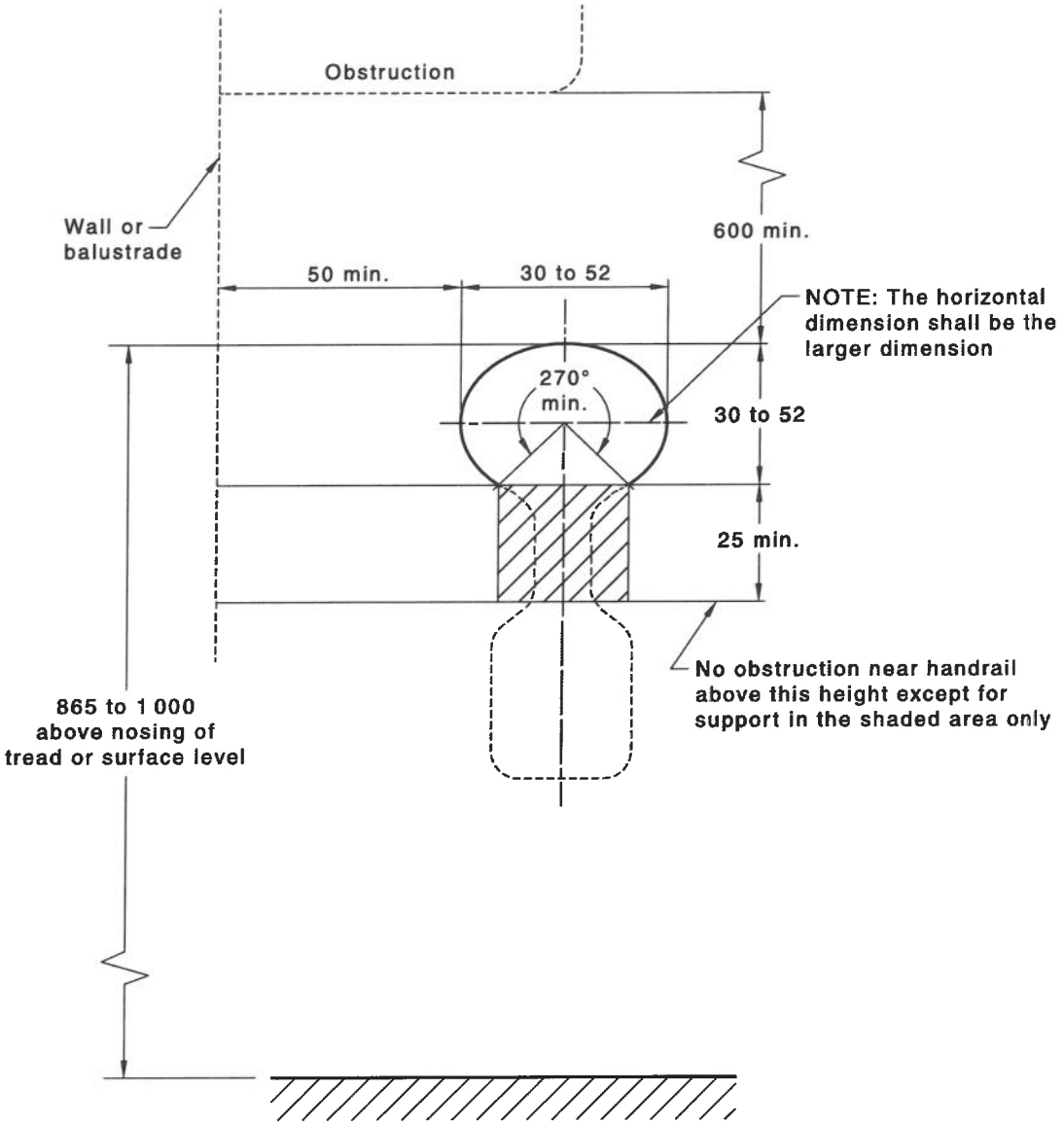
(i) Handrails shall have no obstruction to the passage of a hand along the rail, as shown in Figure 29 (a) and (b).

(j) The inside handrail at landings shall always be continuous, as shown in Figure 28 (b).

Dimensions in millimetres



(a) Circular



(b) Elliptical

Figure 29 — Handrails

Section 10 Doorways, doors and circulation space at doorways

10.1 Doorway identification

All doorways shall have a minimum luminance contrast of 30 % provided between:

(a) door leaf and door jamb; or

(b) door leaf and adjacent wall; or

(c) architrave and wall; or

(d) door leaf and architrave; or

(e) door jamb and adjacent wall.

The minimum width of the area of luminance contrast shall be 50 mm.

NOTE 1 The objective of this clause is to allow the identification of a doorway in a wall by people with low vision.

NOTE 2 See Appendix B for information on the determination of luminance contrast.

10.2 Clear opening of doorways

The minimum clear opening of a doorway on a continuous accessible path of travel shall be 850 mm when measured from the face of the opened door to the doorstop, examples are shown in Figure 30. Where double doors are used, the 850 mm minimum clear opening shall apply to the active leaf. A maximum door reveal depth of 300 mm to the door face applies in all situations.

NOTE For door controls, see Clause 10.4.

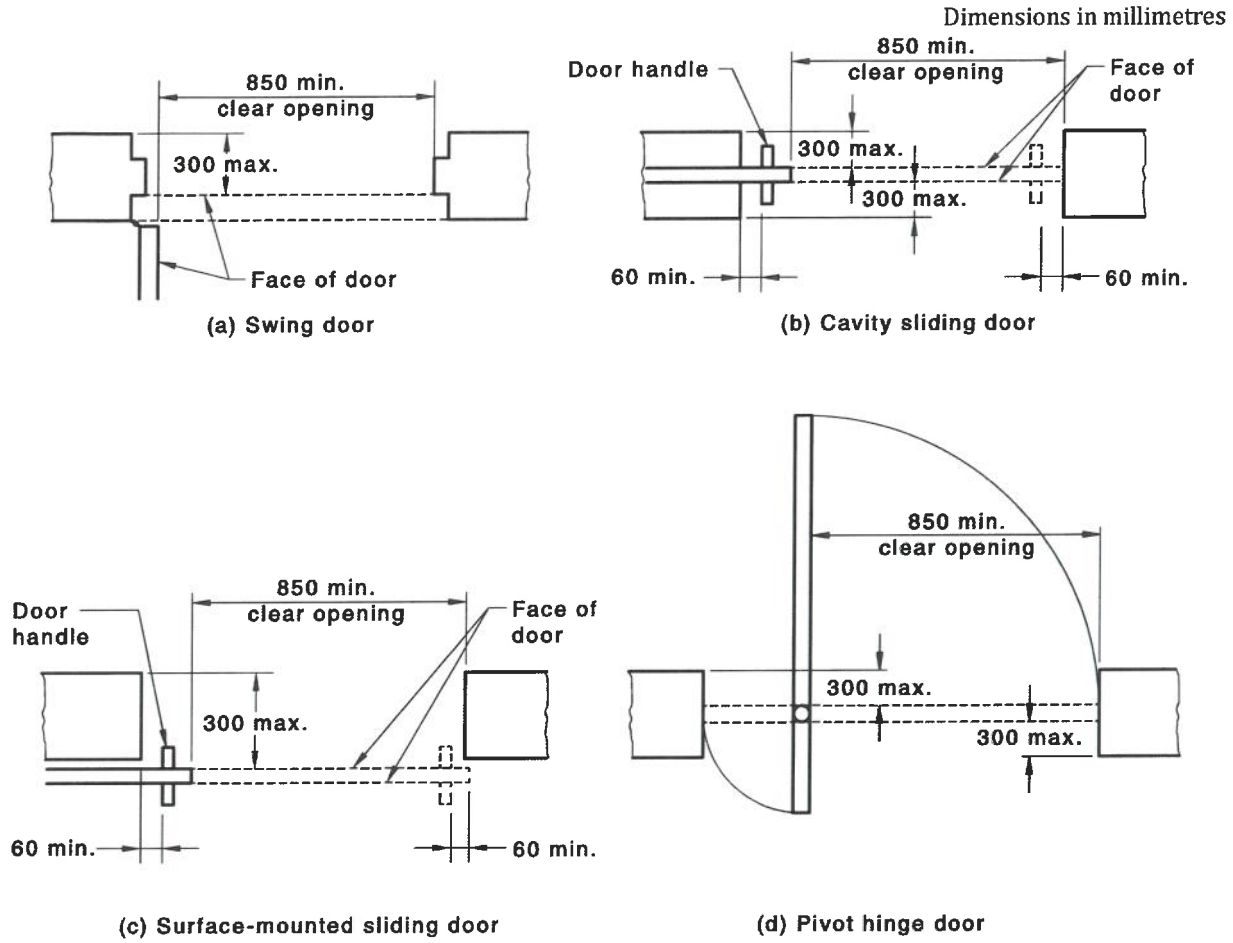


Figure 30 — Examples of clear opening of doorways

10.3 Circulation spaces at doorways on a continuous accessible path of travel

10.3.1 General

Circulation spaces shall be provided at every doorway, gate, or similar entry way, on a continuous accessible path of travel.

Circulation spaces at doorways shall have a gradient and crossfall not steeper than 1 in 40.

Doorway circulation spaces shall be used in combination to allow access through doorways in both directions, as shown in Figures 31 and 32 which detail minimum dimensions.

The dimensions shall also apply in mirror image configurations. Where clear doorway openings are intermediate to those shown in Figures 31 and 32 then the required circulation spaces shall be interpolated.

Doorway circulation spaces may overlap other circulation spaces. (See Figures 31 and 32 for examples.)

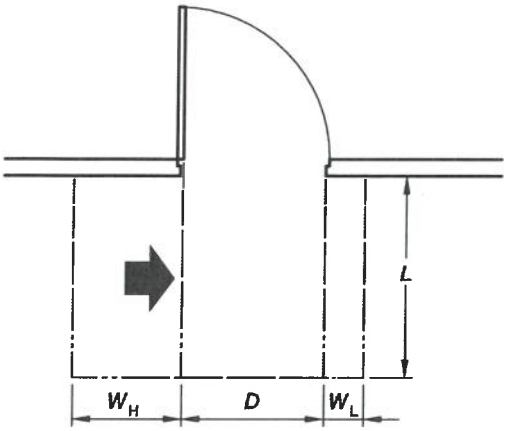
NOTE 1 When setting out works using the dimensions in this section, make appropriate allowances for construction tolerance (see Section 2).

NOTE 2 Refer also to Clause 10.4.3 for clearance of door controls from internal corners. This also applies to sliding door controls when the door is in the open position to allow the door to be closed.

10.3.2 Swinging doors

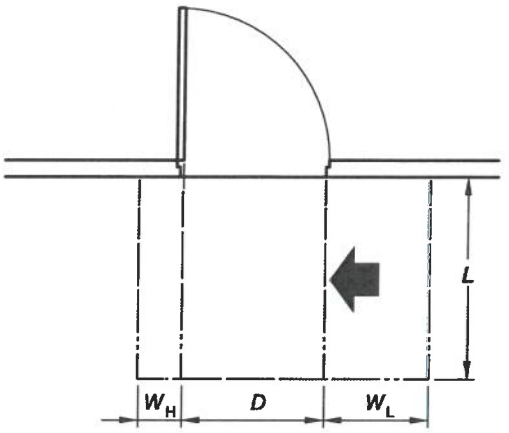
The clear circulation space at doorways with swinging doors is based on the clear opening width of the doorway (see Figure 31 (d)). **The clear circulation space shall be not less than the dimensions specified** in the tables of Figure 31 for the appropriate clear opening width.

Dimensions in millimetres



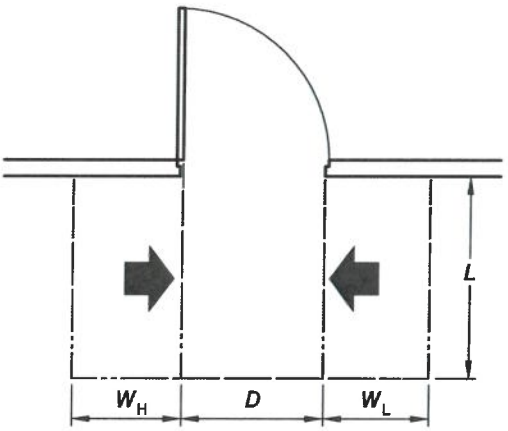
Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 220	560	340
900	1 185	510	340
950	1 160	460	340
1 000	1 140	410	340

(a) Hinge-side approach, door opens away from user



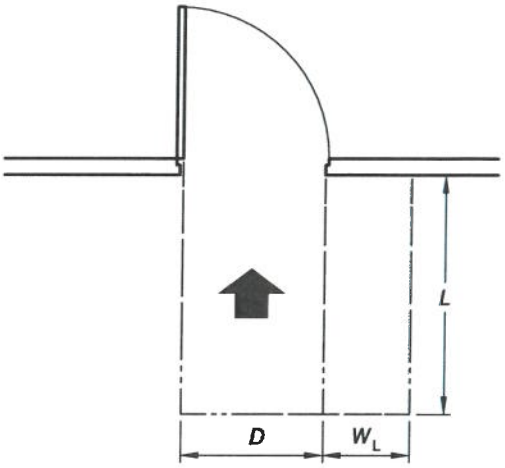
Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 240	240	660
900	1 210	190	660
950	1 175	140	660
1 000	1 155	90	660

(b) Latch-side approach, door opens away from user



Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 240	560	660
900	1 210	510	660
950	1 175	460	660
1 000	1 155	410	660

(c) Either side approach, door opens away from user

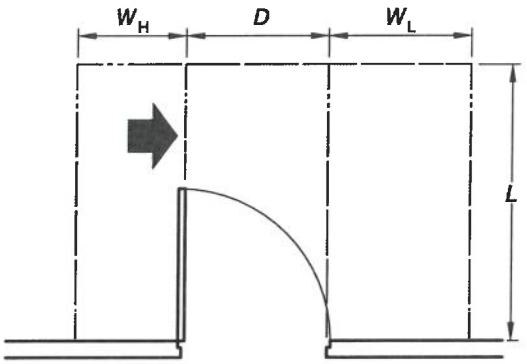


Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 450	0	510
900	1 450	0	510
950	1 450	0	510
1 000	1 450	0	510

(d) Front approach, door opens away from user

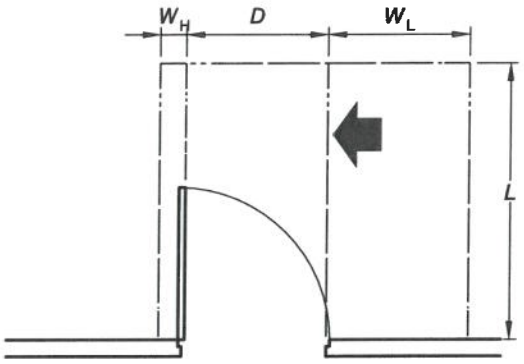
Key

D = Clear opening of width of doorway
L = Length
W_H = Width — hinge side
W_L = Width — latch side
➡ = Direction of approach
–·–· = Circulation space



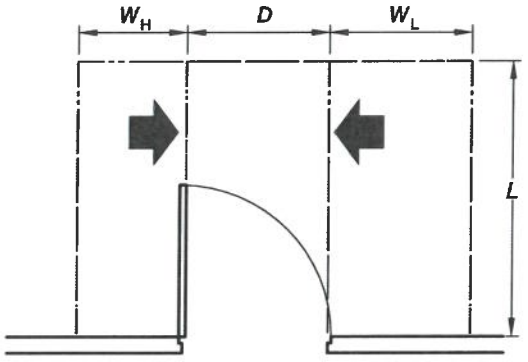
Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 670	660	900
900	1 670	610	900
950	1 670	560	900
1 000	1 670	510	900

(e) Hinge-side approach, door opens towards user



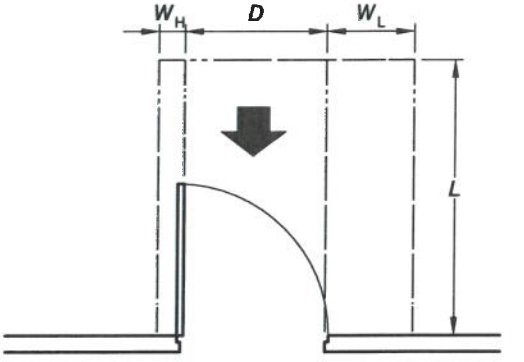
Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 670	110	900
900	1 670	110	900
950	1 670	110	900
1 000	1 670	110	900

(f) Latch-side approach, door opens towards user



Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 670	660	900
900	1 670	610	900
950	1 670	560	900
1 000	1 670	510	900

(g) Either side approach, door opens towards user



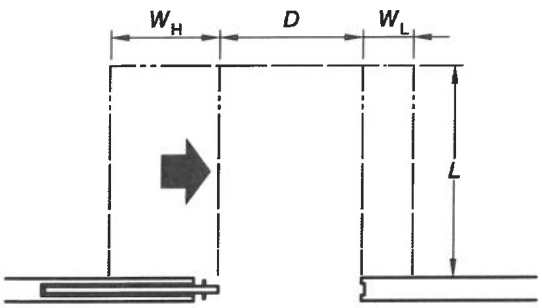
Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 450	110	530
900	1 450	110	530
950	1 450	110	530
1 000	1 450	110	530

(h) Front approach, door opens towards user

Key
D = Clear opening of width of doorway
L = Length
W_H = Width — hinge side
W_L = Width — latch side
➡ = Direction of approach
---- = Circulation space

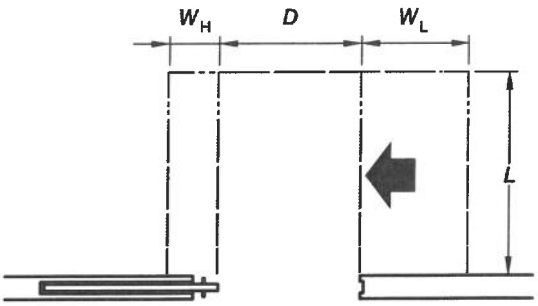
Figure 31 — Circulation spaces at doorways with swinging doors

Dimensions in millimetres



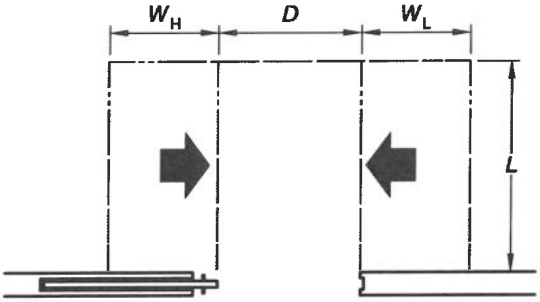
Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 280	660	395
900	1 280	610	395
950	1 280	560	395
1 000	1 280	510	395

(a) Slide-side approach



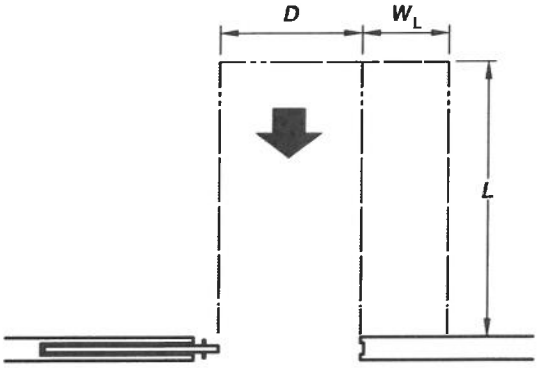
Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 230	185	660
900	1 230	180	660
950	1 230	180	660
1 000	1 230	180	660

(b) Latch-side approach



Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 280	660	660
900	1 280	610	660
950	1 280	560	660
1 000	1 280	510	660

(c) Either side approach



Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1 450	0	530
900	1 450	0	530
950	1 450	0	530
1 000	1 450	0	530

(d) Front approach

Key
D = Clear opening of width of doorway
L = Length
W_H = Width — hinge side
W_L = Width — latch side
➡ = Direction of approach
---- = Circulation space

Figure 32 — Circulation spaces at doorways with sliding doors

10.3.3 Sliding doors

10.3.3.1 General

The clear circulation space at doorways with sliding doors is based on the clear opening width of the doorway (D). The clear circulation space shall be not less than the dimensions specified in the tables in Figure 32 for the appropriate clear opening width.

10.3.3.2 Cavity sliding doors

Where a sliding door is within the wall cavity, the circulation space at the doorway shall be not less than that given in the tables of Figure 32 for the appropriate clear opening width (*D*).

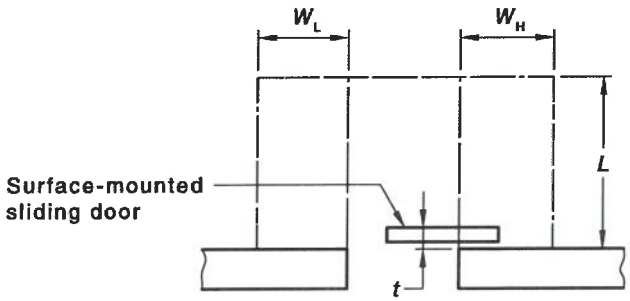
10.3.3.3 Surface-mounted doors

Where a sliding door is surface-mounted, the circulation space adjacent to the door face shall be increased from that given in the tables of Figure 32, by the values given in the table of Figure 33.

NOTE This provision is only applicable on the side of the wall adjoining the surface mounted door.

When a surface-mounted sliding door is automatic, these increases do not apply.

Dimensions in millimetres



Door approach	Increase from Figure 32 on the accessway adjoining the surface mounted door
Figures 32(d), 32(a), 32(b), 32(c)	Add dimensions *t* to dimensions *L*, W_L and W_H

t = door thickness to the face of the wall on side of the door

NOTE See Clause 10.2 for clear openings of doorways.

Figure 33 — Calculating dimensions of the circulation space opposite the door face where a sliding door is surface mounted

10.3.4 Power operated doors

For side approach at power operated doors, circulation space WL or WH is required at the direction of approach only. For front-on approach, neither circulation space WL or WH is required.

NOTE 1 For location of manual controls for power operated doors, see Clause 10.4.3.

NOTE 2 WL is only required when travel is from the L side and WH IS only required when travel is from the H side.

10.3.5 Distance between successive doorways in passages in an accessible path of travel

The distance between doorways in vestibules, air locks and other similarly enclosed spaces shall be not less than 1 450 mm. Where the doors encroach into this space, the distance shall be not less than 1 450 mm plus the door leaf width, as shown in Figure 34 (b), and shall be in accordance with Figure 31 and 32 as applicable.

The distances between doorways in vestibules and air locks on a path of travel to ambulant toilets shall be in accordance with Figure 34.

Dimensions in millimetres

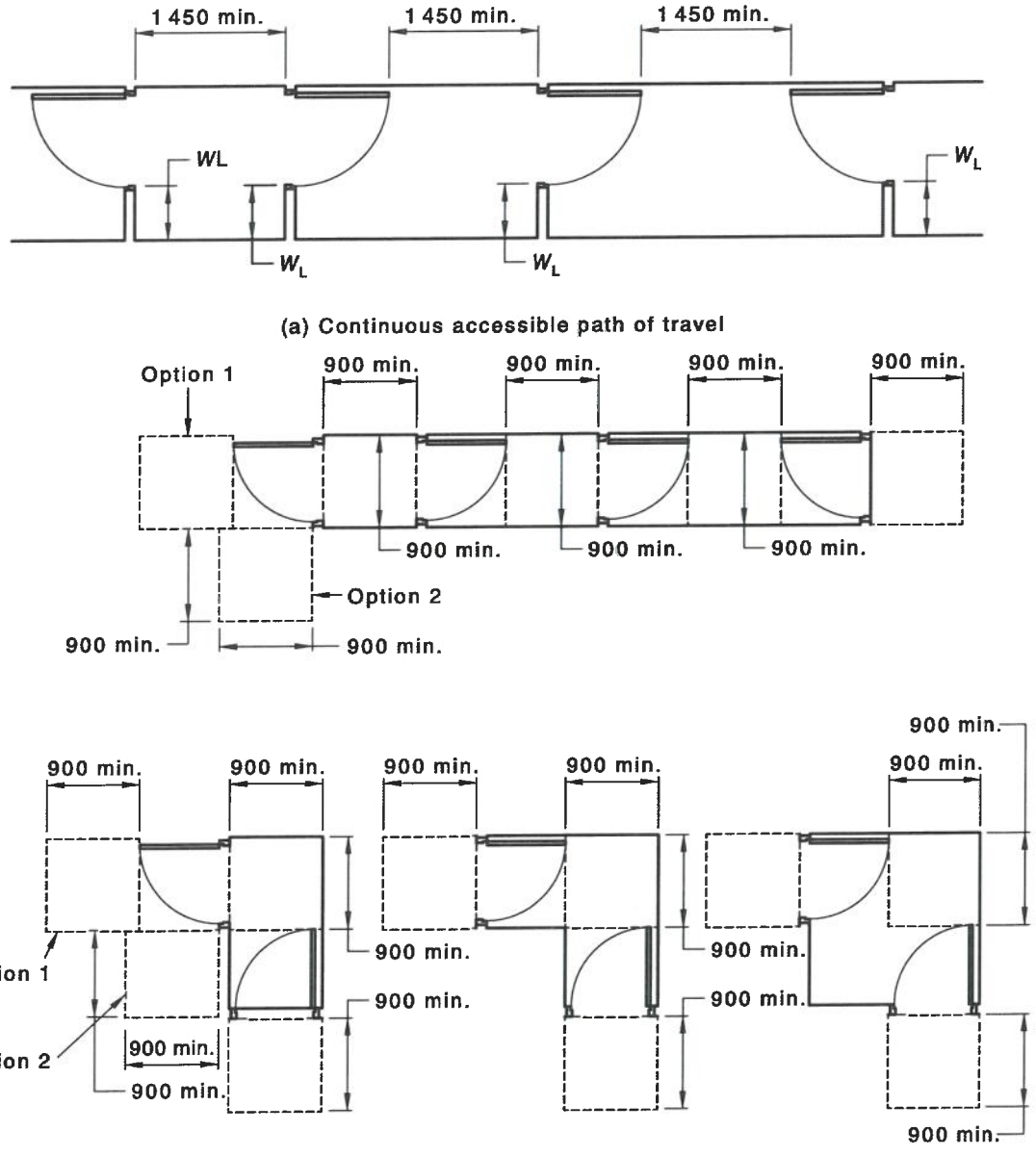


Figure 34 — Continuous accessible path of travel — Distance between successive doorways in vestibules and air locks on a path of travel to ambulant toilets

10.4 Door controls

10.4.1 General

Door controls in, or forming part of, the continuous accessible path of travel shall be in accordance with the requirements of this clause.

10.4.2 Design and performance

Door handles and related hardware and accessories shall be in accordance with the following:

(a) The door handle and related hardware shall be of the type that allows the door to be unlocked and opened with one hand. The handle shall be such that the hand of a person who cannot grip will not slip from the handle during the operation of the latch.

NOTE 1 Figure 35(A) shows examples of suitable hinged door handles. Figure 35(B) shows examples of suitable door handles for sliding doors.

NOTE 2 Door handles of "D" lever type provide an adequate grip for people with hand impairments.

(b) Throughout the operation range, the clearance between the handle and the back plate or between the handle and the door face, whichever is closer, at the centre grip section of the handle shall be not less than 35 mm and not more than 45 mm.

(c) "D" type handles shall be provided on sliding doors.

(d) Where snibs are installed, they shall have a lever handle of a minimum length of 45 mm from the centre of the spindle.

(e) The force required at the door handle to operate the door shall not exceed the following:

(i) To initially open the door — 20 N

(ii) To swing or slide the door — 20 N.

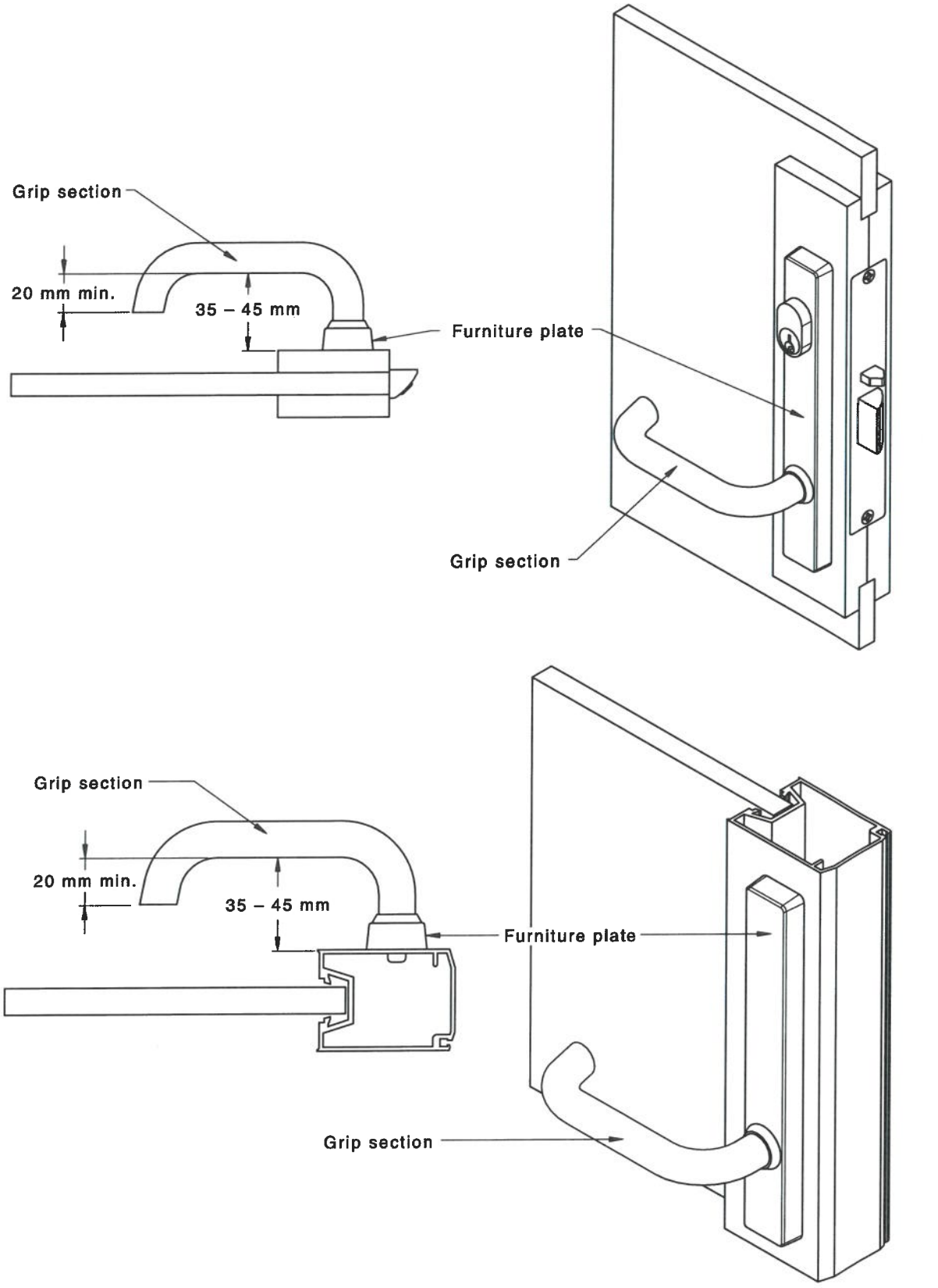
(iii) To hold the door open between 60° and 90° — 20 N.

NOTE 3 These requirements do not apply to fire doors and smoke doors.

(f) Where a closer is fitted at doors other than fire doors and smoke doors it shall have adjustable delayed action or hold-open function.

(g) Where an outward opening door is not self-closing, a horizontal handrail or pull bar shall be fixed on the closing face of a side-hung door, as shown in Figure 36.

Dimensions in millimetres



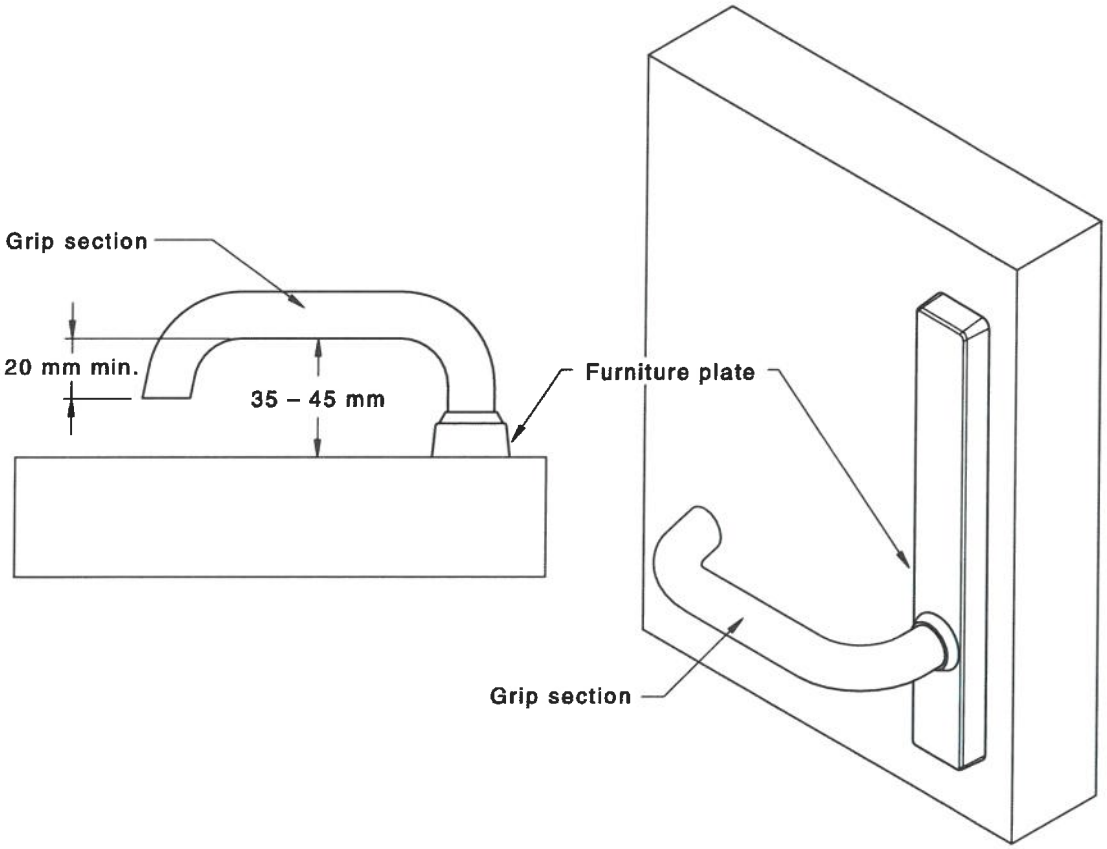


Figure 35(A) — Example of acceptable door hardware for hinged doors

Dimensions in millimetres

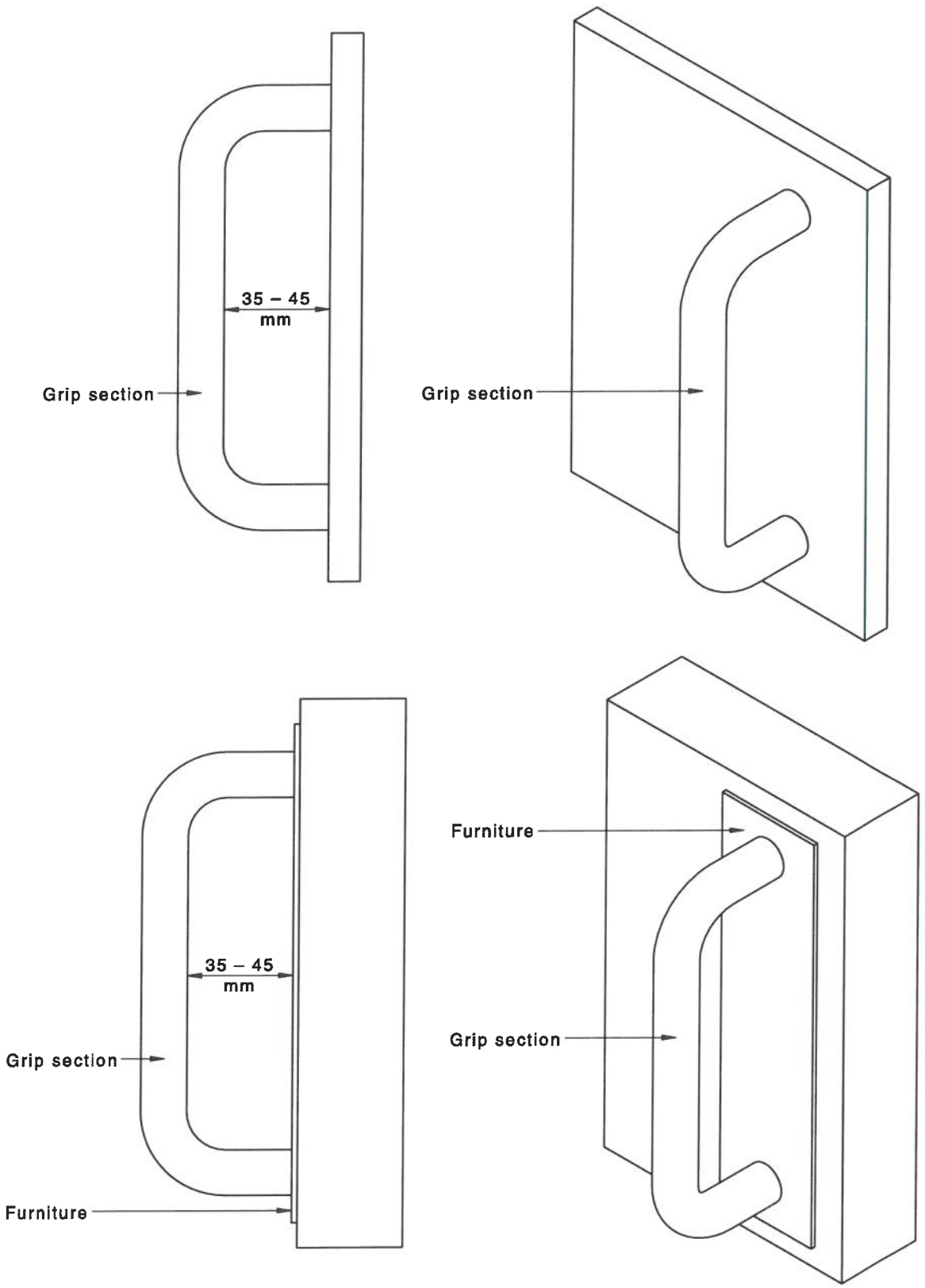
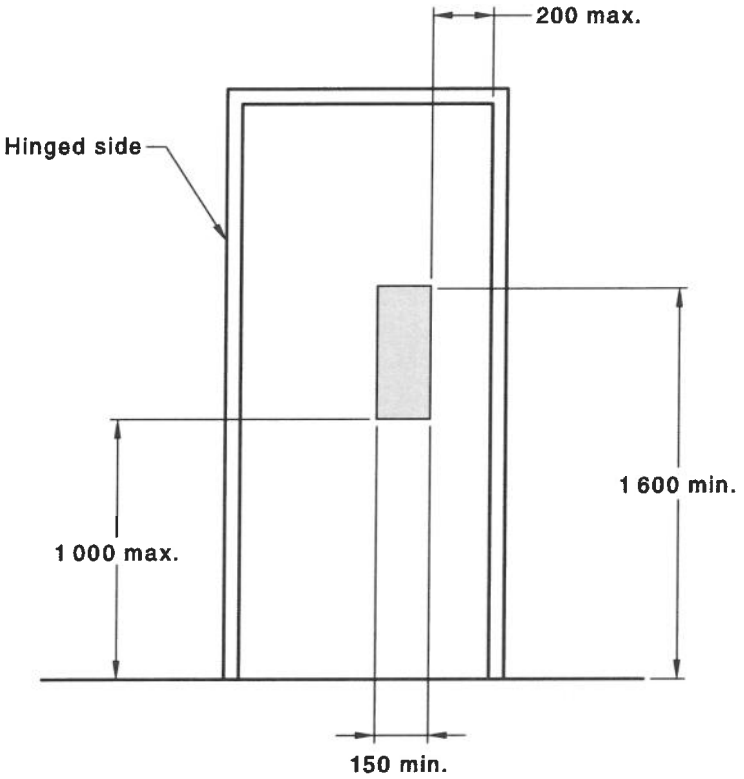
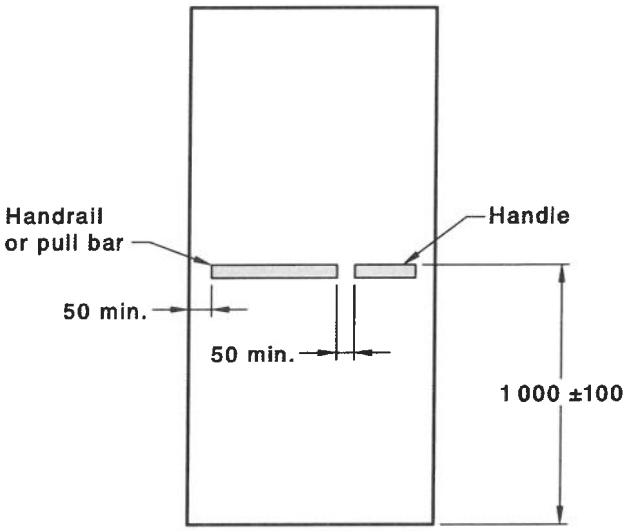


Figure 35(B) — Example of acceptable door hardware for sliding doors

Dimensions in millimetres



(a) Minimum zones for glazed viewing panel



(b) Location of door controls showing face

Figure 36 — Locations for door controls showing closing face and minimum zones for glazed viewing panel

10.4.3 Location

Except in early childhood centres, swimming pool barriers or similar situations where the location of the opening and locking controls is prescribed by the relevant statutory authority, the location of the controls for doors and gates shall be above a level surface and as follows:

(a) Controls that need to be grasped or turned or pushed or pulled to operate a door shall be not less than 900 mm and not more than 1 100 mm above the plane of the finished floor, as shown in Figure 36 and not less than 500 mm from an internal corner except as specified in AS 1735.12.

(b) Controls that only need to be pushed in the direction of travel, such as panic bars on egress routes, shall be not less than 900 mm, and not greater than 1 200 mm above the plane of the finished floor.

(c) Controls that only need to be touched shall be not less than 900 mm, and not greater than 1 250 mm above the plane of the finished floor, and not less than 500 mm from an internal corner except as specified in AS 1735.12.

(d) Handles on sliding doors shall be not less than 60 mm from the door jamb or doorstop when in the open or closed position, as shown in Figure 30.

(e) Manual controls to power-operated doors shall be located on the continuous accessible path of travel no closer than 500 mm from an internal corner and between 500 mm to 1 000 mm from the arc of the hinged door leaf or clear of a surface-mounted sliding door in the open position.

10.4.4 Power-operated door controls

Push-button controls shall have a minimum dimension of 25 mm diameter and be proud of the surface and shall activate the door before the button becomes level with the surrounding surface

Section 11 Switches and general purpose outlets (power points)

11.1 General

All switches and controls on an accessible path of travel, other than general purpose outlets, shall be located not less than 900 mm nor more than 1100 mm above the plane of the finished floor and not less than 500 mm from internal corners except where on the architrave on the latch side as shown in Figure 37.

NOTE 1 When setting out works using the dimensions in this section, make appropriate allowances for construction tolerance (see Section 2).

NOTE 2 The term "controls" can include heating and cooling controls, ventilation controls, security controls or similar.

11.2 Accessible sole-occupancy units and accessible sanitary facilities

Rocker action and toggle switches shall be provided and have a minimum dimension of 30 mm × 30 mm. Push-pad switches shall have a minimum dimension of 25 mm in diameter.

General purpose outlets shall be located not less than 600 mm nor more than 1 100 mm above the plane of the finished floor and not less than 500 mm from internal corners.

Dimensions in millimetres

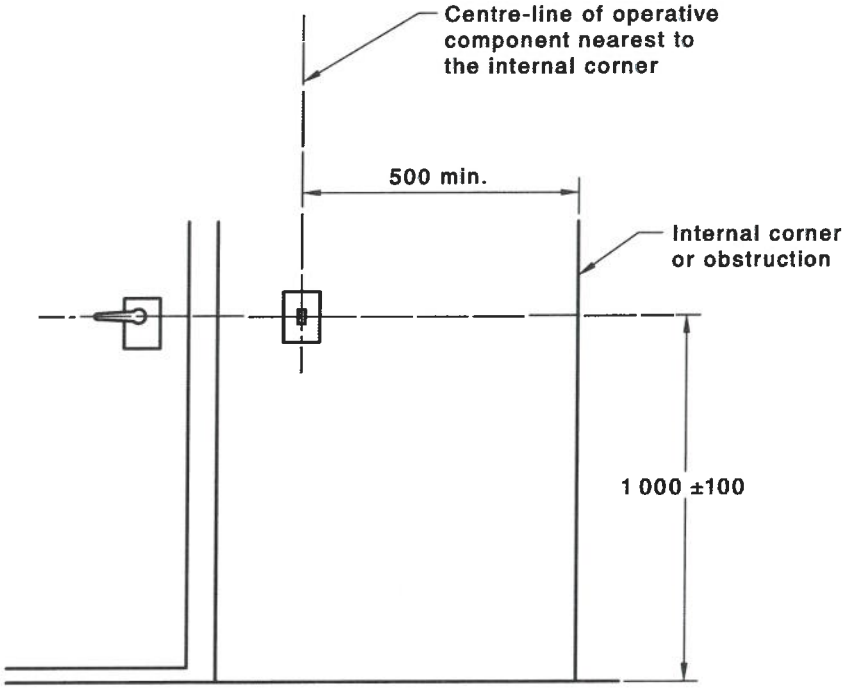


Figure 37 — Heights for switches and door handles

Section 12 Sanitary facilities

12.1 General

The facilities described in this clause may be used as individual modules, in mirror image configurations or in a combined form, as specified in Clause 12.6.

NOTE When setting out works using the dimensions in this section, make appropriate allowances for construction tolerance (see Section 2).

12.2 Accessible unisex sanitary facilities

12.2.1 Water taps

Water taps shall be in accordance with the following:

(a) Taps shall have lever handles, sensor plates, voice activation or other similar controls.

(b) Lever handles shall have not less than 50 mm clearance from an adjacent surface.

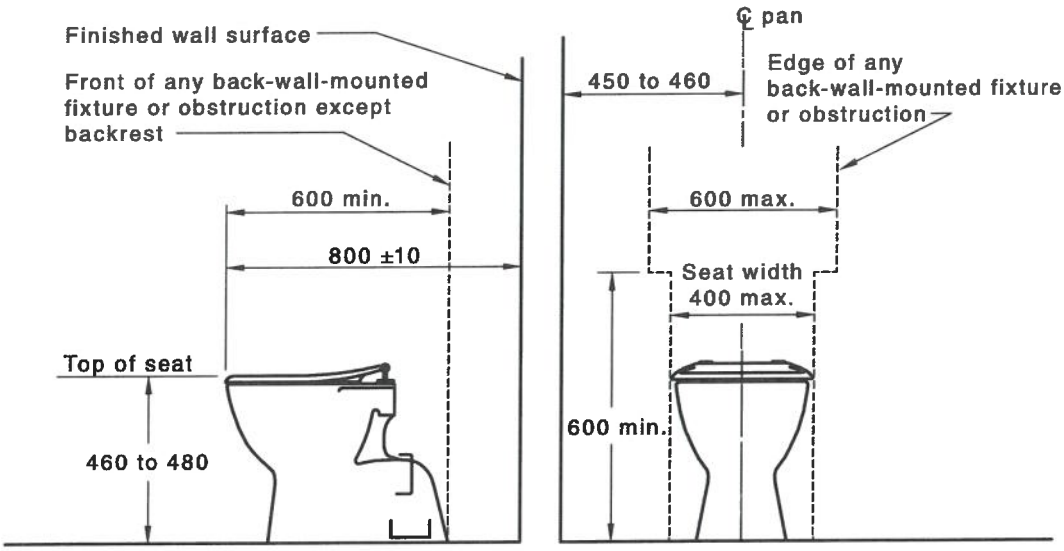
(c) Where separate taps are provided for hot and cold water, the hot water tap shall be placed to the left of the cold water tap for horizontal configurations, or above the cold water tap for vertical configurations.

(d) Where hot water is provided, the water shall be delivered through a mixing valve outlet.

12.2.2 WC pan clearances

WC pan clearances, including set-out, seat height and seat width shall be as shown in Figure 38.

Dimensions in millimetres



NOTE 1 For the purpose of dimensioning, the front of the WC pan has been taken as the datum plane.

NOTE 2 The dimension of 800 ± 10 mm from the front of the WC pan to the wall is a critical dimension.

Figure 38 — Water closet pan clearances, seat height and seat width

12.2.3 Seat

A toilet seat shall be provided on accessible toilets. The toilet seat shall —

(a) be of the full-round type, (i.e. not open fronted);

(b) be securely fixed in position when in use;

(c) have seat fixings that create lateral stability for the seat when in use;

(d) be load-rated to 150 kg; and

(e) have a minimum luminance contrast of 30 % with one of the following options.

- (i) seat and pan; or
- (ii) seat and wall; or
- **(iii) seat and floor against which it is viewed.**

(f) remain in the upright position when fully raised.

12.2.4 Backrest

A backrest shall be provided on accessible toilets, including those in accessible sole-occupancy units. The backrest shall —

(a) be capable of withstanding a force in any direction of 1100 N; and

(b) at its face, have a vertical height of 150 to 200 mm and a width of 350 to 400 mm, (Figure 39) and;

(c) have its face inclined to 95° to 100° to the horizontal; and

(d) be centred on the WC pan centre-line; and

(e) be located with the lower edge of the centre of the face 120 to 150 mm above the WC seat and 430 to 495 mm from the front of the WC pan (Figure 39); and

(f) be located to allow the seat to remain in the raised position; and

(g) in an accessible sole-occupancy unit, be capable of being removed and refitted.

Dimensions in millimetres

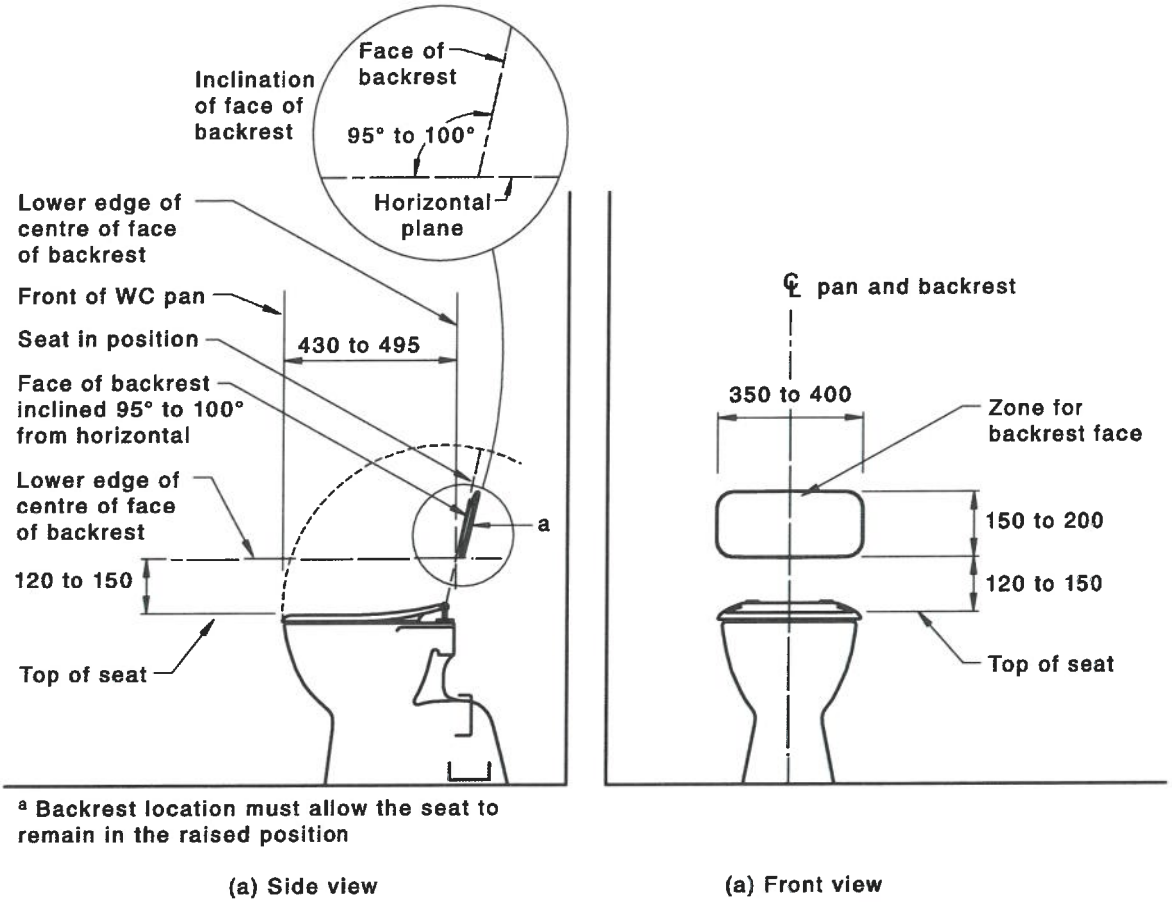


Figure 39 — Backrest installation front and side view

12.2.5 Flushing control

Flushing controls shall be user activated, hand operated, electronic sensor or automatic. Where hand-operated flushing controls are used, they shall be located within the zone shown in Figure 40, or centred on the centre-line of the toilet, wholly within the vertical limits of that zone. The position of the flushing control within this zone shall not be within the area required for any grabrails or backrest. The flushing control shall be proud of the surface and shall activate the flush before the button becomes level with the surrounding surface unless provided with electronic sensor(s) option.

Flushing control shall not be located within the zone of the backrest or within 50 mm of any grab rail.

Dimensions in millimetres

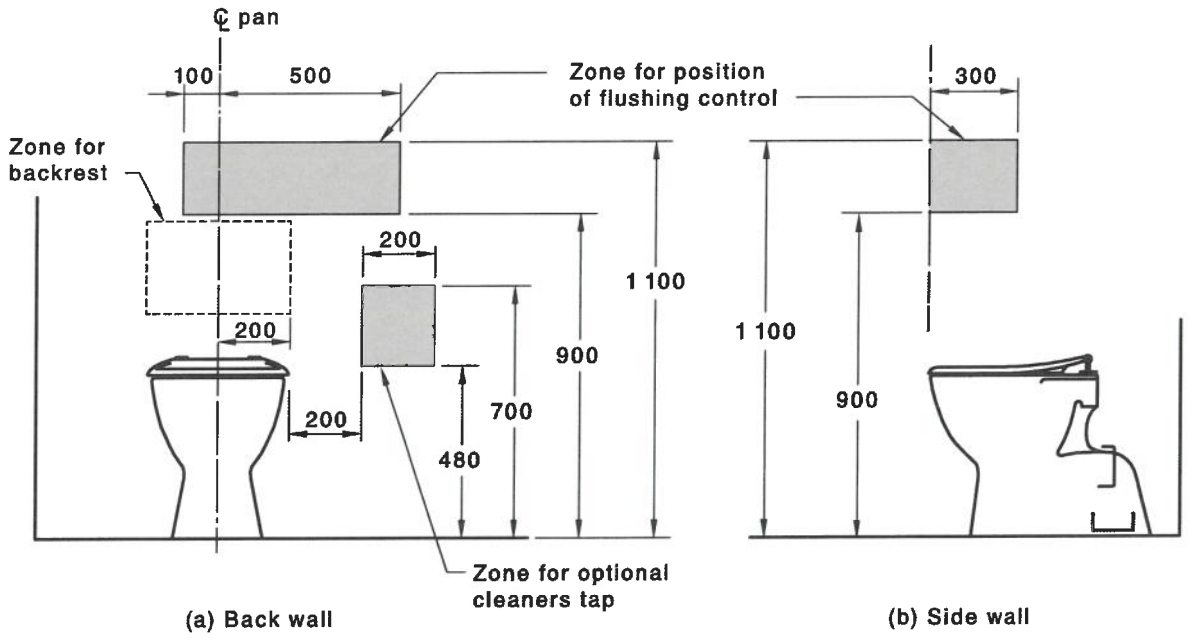


Figure 40 — Zone for position of flushing control

12.2.6 Toilet paper dispenser

The outlet for the toilet paper dispenser shall be located within the zone specified in Figure 41.

The toilet paper dispenser shall not encroach upon the clearance space required around the grabrail specified in Clause 14.

Toilet roll shall not have a projection from the wall of more than 150 mm.

Dimensions in millimetres

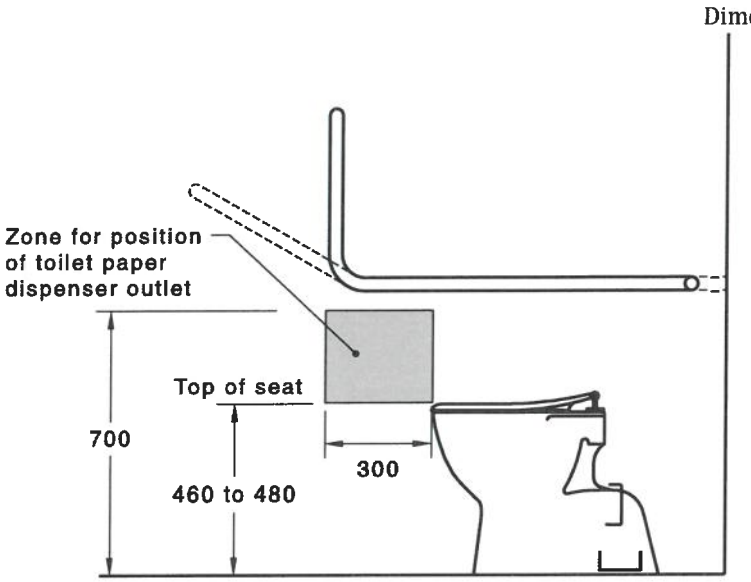
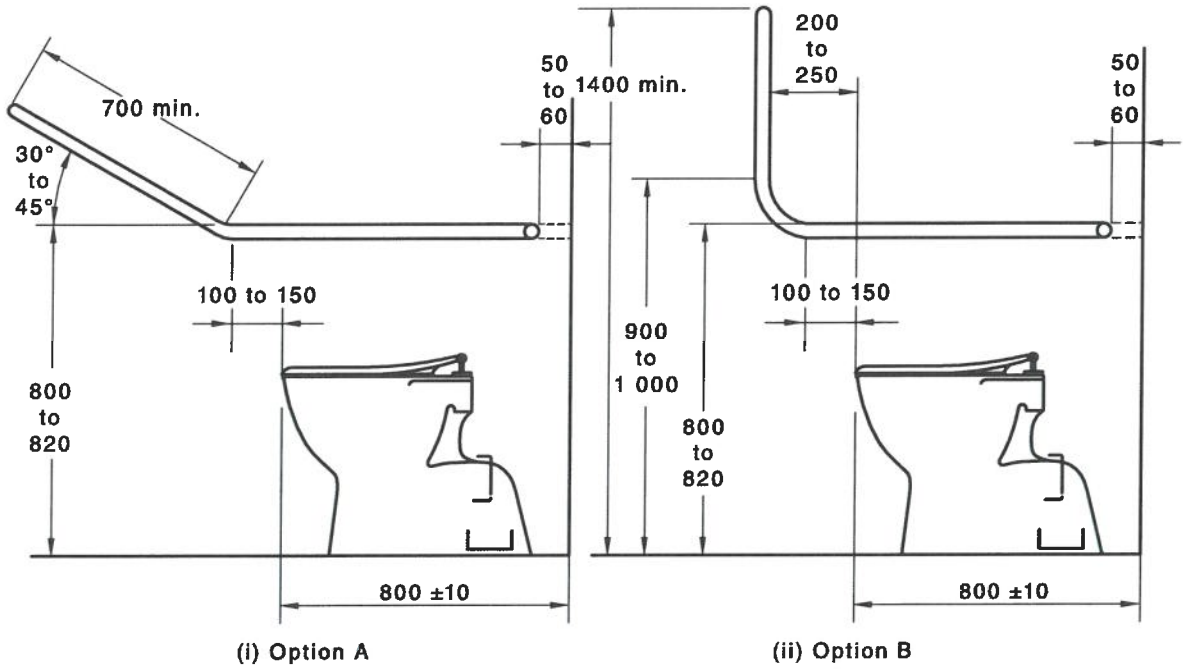


Figure 41 — Zone for position of toilet paper dispenser

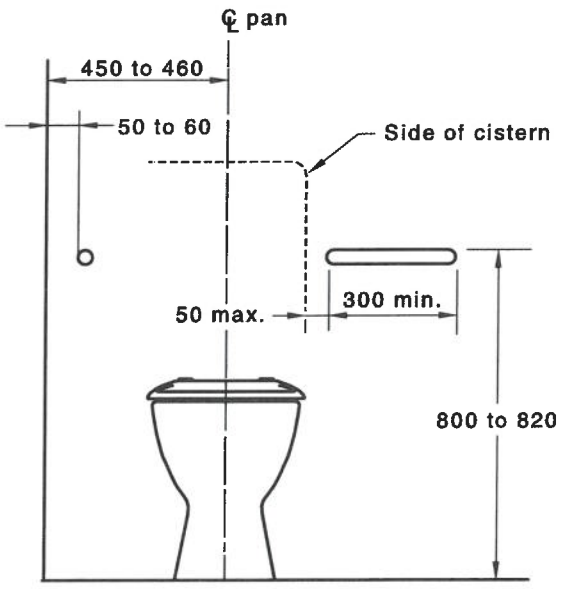
12.2.7 Grabrails

Grabrails, as specified in Section 14, shall be provided across the rear wall and at the side wall nearest the WC pan, as shown in Figure 42. Where there is no obstruction, the rear wall grabrail may extend across the wall to the side wall.

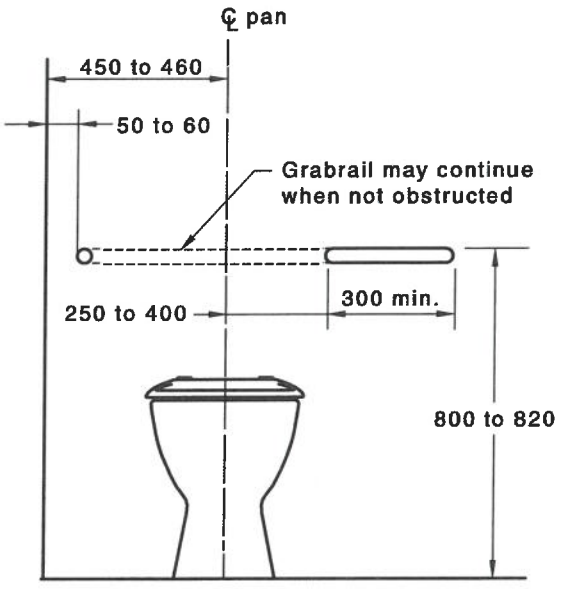
Dimensions in millimetres



(a) Side view showing optional systems for grabrail at sides of pan



(b) Grabrail at back of pan with surface-mounted cistern and sectional view of grabrail at side of pan



(c) Grabrail at back of pan with concealed or remote cistern and sectional view of grabrail at side of pan

Figure 42 — Positions of grabrails in water closets

12.2.8 Circulation space

12.2.8.1 General

For each WC pan the unobstructed circulation space from the finished floor to a height of not less than 2 000 mm shall be as shown in Figure 43. The only fixtures or fittings that may encroach into the circulation space below a height of 900 mm are as follows:

(a) The toilet paper dispenser (see Clause 12.2.6).

(b) Grabrails (see Clause 12.2.7).

(c) Backrest (see Clause 12.2.4).

(d) Portable sanitary disposal unit as shown in Figure 50.

(e) Washbasin / vanity bench limited to 100 mm encroachment as shown in Figures 43, 44 and 45.

(f) Where provided, wall-mounted taps e.g. Cleaner's tap (see Figure 40).

Where provided, additional fittings and fixtures may encroach into the WC pan circulation space up to a maximum of 150 mm but shall provide a minimum of 900 mm clearance below. Such fittings and fixtures include the following:

(i) Hand dryers and towel dispensers.

(ii) Soap dispensers (see Clause 12.4.3).

(iii) Shelves (see Clause 12.4.2).

(iv) Wall cabinets.

(v) Clothes hanging devices (see Clause 12.4.4).

(vi) Other wall mounted fixtures, such as dispensing units and sharps disposal units.

The overlapping of circulation spaces shall be in accordance with Clause 12.6.

The WC pan circulation space may encroach into the shower cubicle but shall remain clear of the shower seat in folded position.

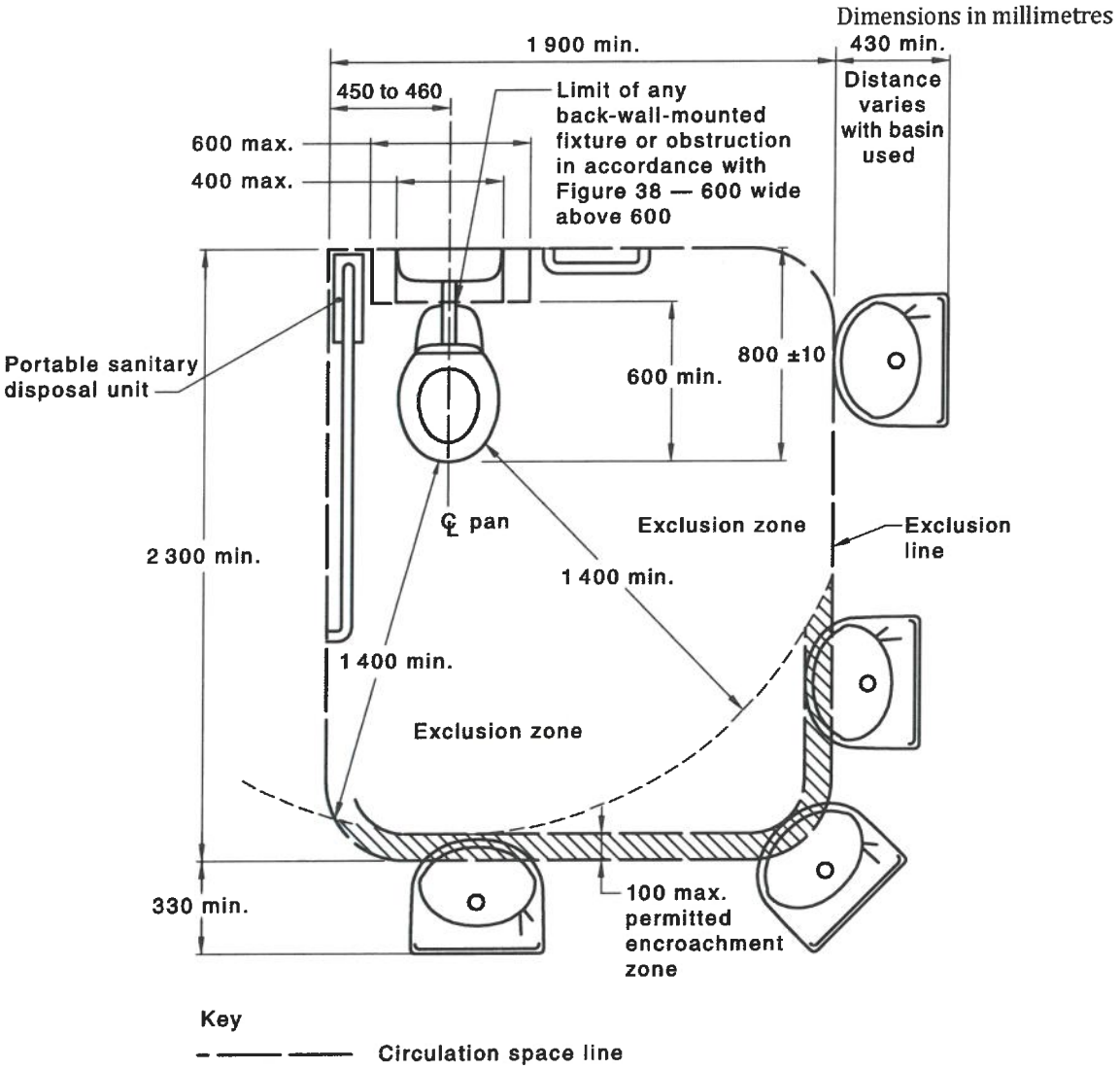
The WC pan circulation space may overlap other circulation spaces.

12.2.8.2 Baby change tables

Where installed, baby change tables shall —

(a) not encroach into the circulation space of any other toilet facility when in the folded up position; and

(b) have a maximum height of 820 mm and a minimum clearance underneath of 720 mm when in the open position.



NOTE This circulation space may overlap any other circulation spaces specified in this document. Grabrails shall be provided in accordance with Clause 12.2.7.

Figure 43 — Circulation space for WC pan — Right-hand transfer (left-hand transfer is mirror reversed)

See Clause 12.2.8.1 for other allowable encroachments.

12.2.9 WC doors

WC doors may be either hinged or sliding. WC doors shall be in accordance with the following:

(a) Outward-opening doors shall have a mechanism that holds the door in a closed position without the use of a latch.

(b) Doors shall be provided with an in-use indicator and a bolt or catch. Where a snib catch is used, the snib handle shall have a minimum length of 45 mm from the centre of the spindle. In an emergency, the latch mechanism shall be openable from the outside.

(c) The force required to operate the door shall be in accordance with Clause 10.4.2(e).

(d) Door handles and hardware shall be in accordance with Clause 10.4.

12.2.10 Washbasins for unisex accessible sanitary facilities

A hand-washing facility shall be provided inside the toilet cubicle and shall form part of the accessible unisex facility (see Clause 12.3).

12.3 Washbasins

12.3.1 General

The installation of washbasins shall be in accordance with the following:

(a) The washbasin may encroach a maximum of 100 mm into the circulation space of a WC pan. (See Figure 43.)

(b) The washbasin may encroach a maximum of 100 mm into the circulation space of a shower recess. (See Figures 44(A), 44(B), 45 and 46 for examples.)

(c) The washbasin may encroach into a door circulation space. (See Figures 51(A) and 51(B) for examples.)

(d) Water taps shall be in accordance with Clause 12.2.1.

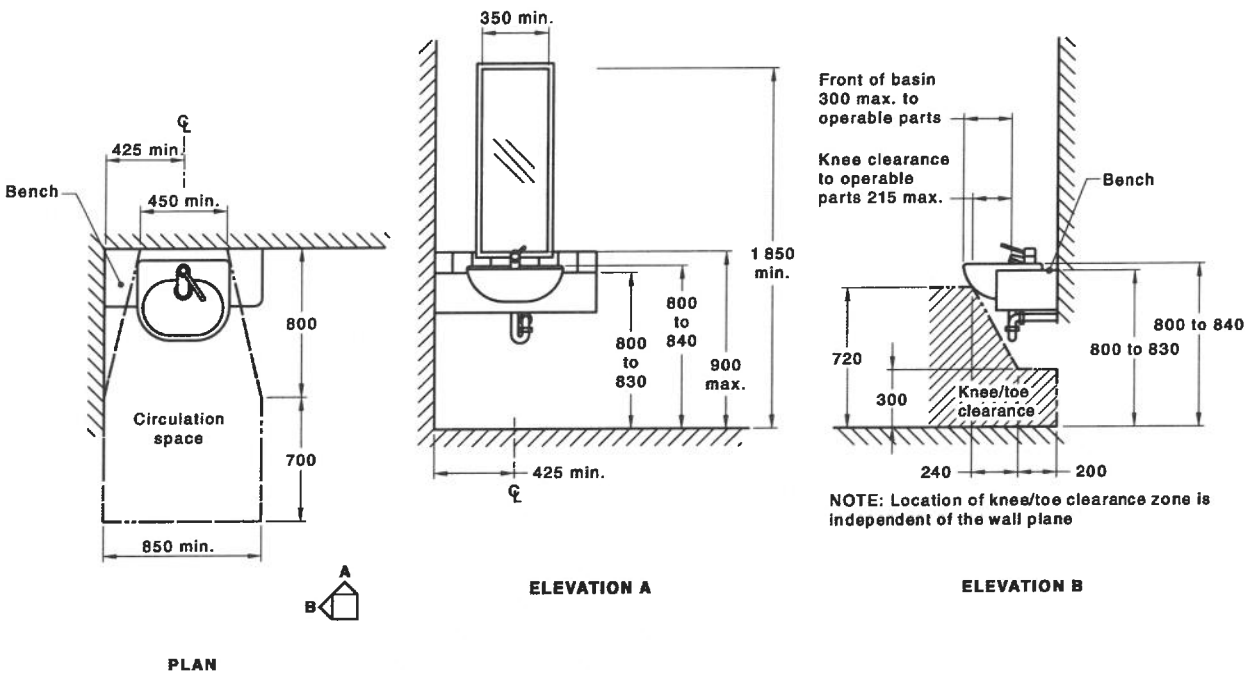
(e) Exposed hot water supply pipes shall be insulated or located so as not to present a hazard.

(f) The projection of the washbasin from the wall and the position of taps, bowl and drain outlet shall be determined in accordance with Figures 44(A) and 44(B); except in sole-occupancy units, where Figure 45 shall apply.

(g) Water supply pipes and waste outlet pipes shall not encroach on the required clear space under the washbasin. (See Figures 51(A) and 51(B) for examples.)

For each washbasin fixture, the unobstructed circulation space shall be as shown in Figure 46; except in sole occupancy units, where Figure 45 shall apply. The washbasin fixture and its fittings are the only fixtures permitted in this space. "Fittings" include the bench at a semi-recessed washbasin and a vanity top at a sole-occupancy unit washbasin. The washbasin circulation space may overlap other circulation spaces. (See Figure 43 and 50(A), 50(B), 51(A) and 51(B) for examples.)

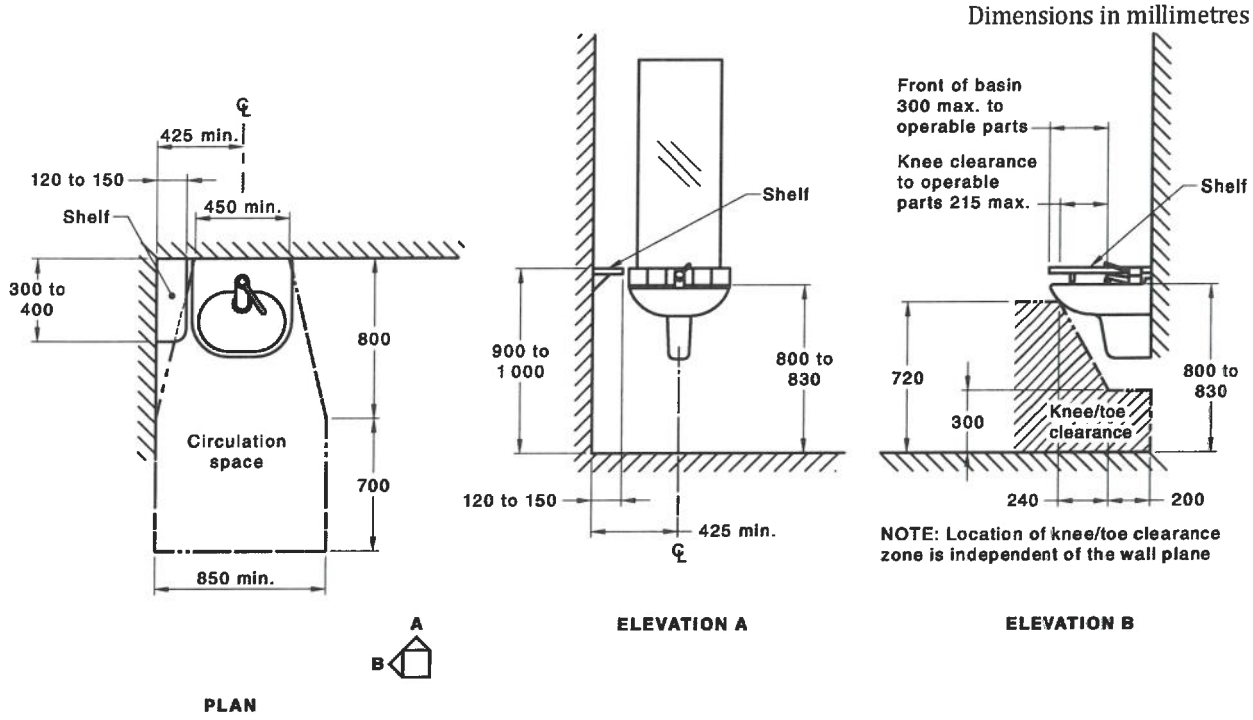
Dimensions in millimetres



NOTE "Operable parts" means the centre-line of the tap, or where a lever handle is provided, the end point of the lever measure throughout its arc of movement, or where a sensor is provided where the sensor is reliably activated.

Figure 44(A) — Semi-recessed washbasin installation —Other than for sole-occupancy unit

Dimensions in millimetres



NOTE "Operable parts" means the centre-line of the tap or, where a level handle is provided, the end point of the level measure throughout its arc of movement, or where a sensor is provided where the sensor is reliably activated.

Figure 44(B) — Wall-mounted washbasin installation — other than for sole-occupancy unit

12.3.2 Accessible sole occupancy units

Accessible sole occupancy units shall have the following characteristics:

(a) The projection of the washbasin from the wall and the position of taps, bowl and drain outlet shall be determined in accordance with Figure 45.

(b) Water supply pipes and waste outlet pipes shall not encroach on the required clear space under the washbasin, as shown in Figure 45.

(c) Shelf space shall be provided adjacent to the washbasin in one of the following ways:

(i) As a vanity top —

(A) at a height of 800 mm to 830 mm above the floor;

(B) with a minimum width of 120 mm beside the basin;

(C) with a minimum depth of 300 mm from the front to the rear wall; and

(D) with no encroachment into any knee and toe clearance space for a minimum width of 850 mm centred on the basin.

(ii) As a separate fixture —

(A) within any circulation space at a height of 900 mm to 1 000 mm with a minimum underside clearance of 850 mm for a width depth of 120 mm to 150 mm and length width of 300 mm to 400 mm; and

(B) within the circulation space of a doorway in accordance with Figures 45 and 46; and

(C) external to all circulation spaces at a height of 800 mm to 1 000 mm with a minimum width depth of 120 mm and minimum length width of 400 mm.

Dimensions in millimetres

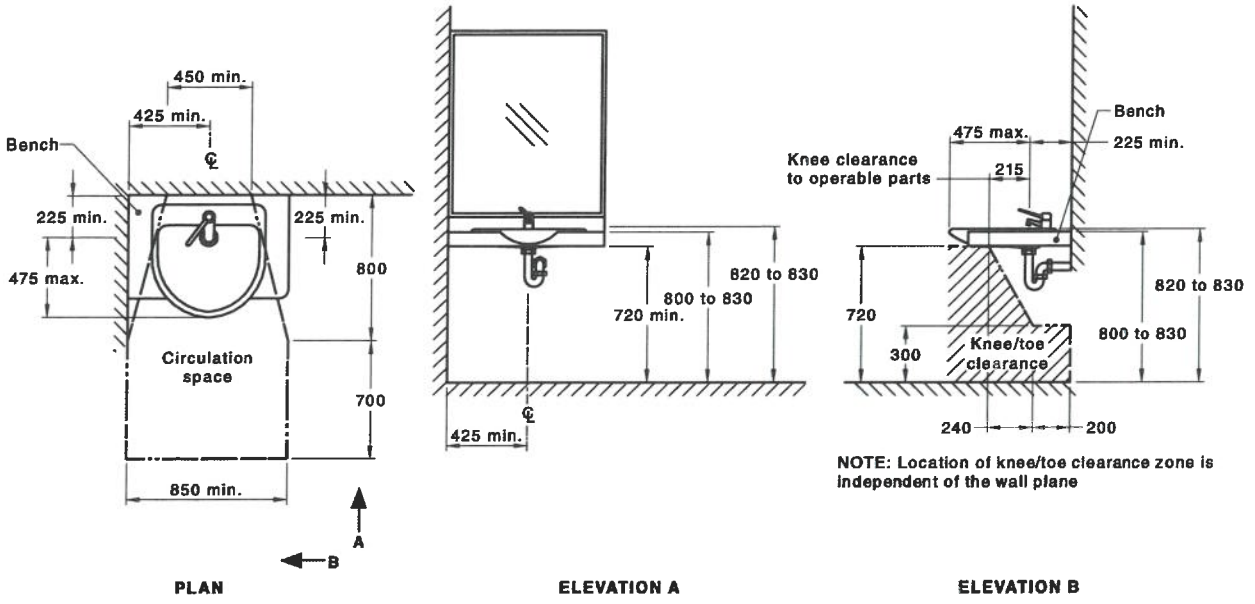
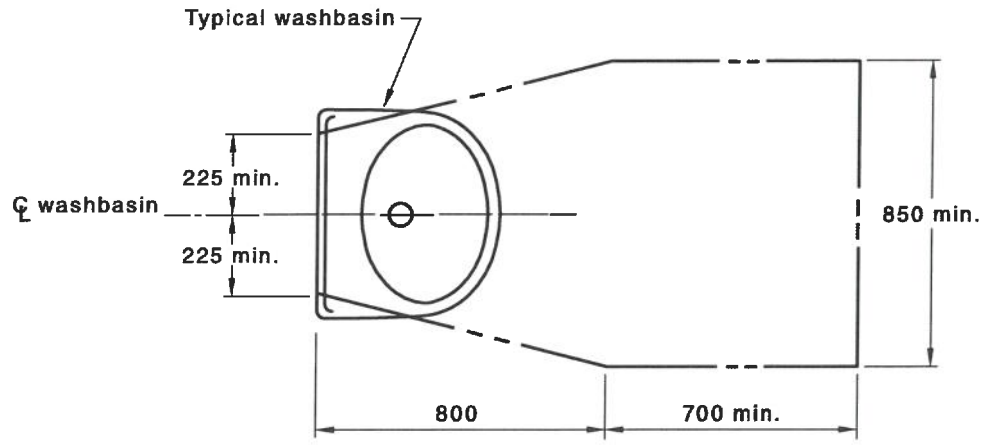


Figure 45 — Washbasin for accessible sole-occupancy unit

Dimensions in millimetres



Key

Circulation space

Figure 46 — Circulation space for washbasins

12.4 Fixtures and fittings within a sanitary facility

12.4.1 Mirrors

In all sanitary facilities, a mirror shall be provided and located either above or adjacent to the washbasin.

Where located above the washbasin, the mirror shall extend from a height of not more than 900 mm to a height of not less than 1 850 mm above the plane of the finished floor. Where located adjacent to a washbasin, the mirror, shall extend from a height of not more than 780 mm to a height of not less than 1 850 mm above the plane of the finished floor.

No mirror shall be less than 350 mm wide. All dimensions apply to the reflective surface of the mirror. The reflective surface shall be vertical.

In an accessible sole occupancy unit, a mirror shall be centred over the washbasin.

12.4.2 Shelves

Shelf space shall be provided adjacent to the washbasin in one of the following ways:

(a) As a vanity top at a height of 800 mm to 830 mm and a minimum width of 120 mm and a minimum depth of 300 mm and a depth no greater than of the bowl plus its front and back flanges without encroaching into the circulation space of any other fixture.

(b) As a separate fixture —

  (i) within any circulation space at a height of 900 mm to 1 000 mm with a width of 120 mm to 150 mm and length of 300 mm to 450 mm; and

  (ii) external to all circulation spaces at a height of 790 mm to 1 000 mm with a minimum width of 120 mm and minimum length of 400 mm.

12.4.3 Soap dispensers, towel dispensers and similar fittings

Where provided, soap dispensers, towel dispensers, hand dryers and similar fittings shall be operable by one hand, and shall be installed with the height of their operative component or outlet not less than 900 mm and not more than 1 100 mm above the plane of the finished floor, and no closer than 500 mm from an internal corner.

12.4.4 Clothes-hanging devices

A clothes-hanging device shall be installed 1 200 mm to 1 350 mm above the plane of the finished floor and not less than 500 mm out from any internal corner.

12.4.5 Sanitary disposal unit

Where provided, the sanitary disposal unit shall be located as follows:

(a) Portable unit as shown in Figure 43.

(b) Recessed unit within 500 mm from the pan.

12.4.6 Switches and general purpose outlets

Where provided near the washbasin, switches and general purpose outlets shall be located in accordance with Clause 11 and as close to the shelf or worktop as practicable.

NOTE For requirements on general wiring rules refer to AS/NZS 3000.

12.5 Showers

12.5.1 General

The general requirements for showers are as follows:

(a) Shower recesses and circulation spaces for each shower recess from the finished floor to a minimum height of not less than 2 000 mm shall be as shown in Figure 47. Grabrails, shower hose fittings, taps, soap holder, shelf (if provided), clothes hanging devices and the folding seat are the only features permitted in these spaces.

(b) Shower recess fittings shall be provided as shown in Figures 47 and 48. Not less than two clothes-hanging devices, as specified in Clause 12.4.4, shall be fitted outside the shower recess. One such device shall be located within 400 ± 10 mm and the other within 600 ± 10 mm of the folding seat.

(c) If two or more shower recesses are provided, at least one shall be of the opposite hand.

(d) Taps shall be located on the side of the shower head support grabrail nearer the folding seat.

(e) The shower recess circulation space may overlap other circulation spaces. (See Figure 47 for examples.)

12.5.2 Floor and waste outlet

The requirements for the floor and waste outlet are as follows:

(a) The floor of the shower recess and associated circulation space shall be self-draining and without a step-down, raised step kerb or hob at the entry to the recess.

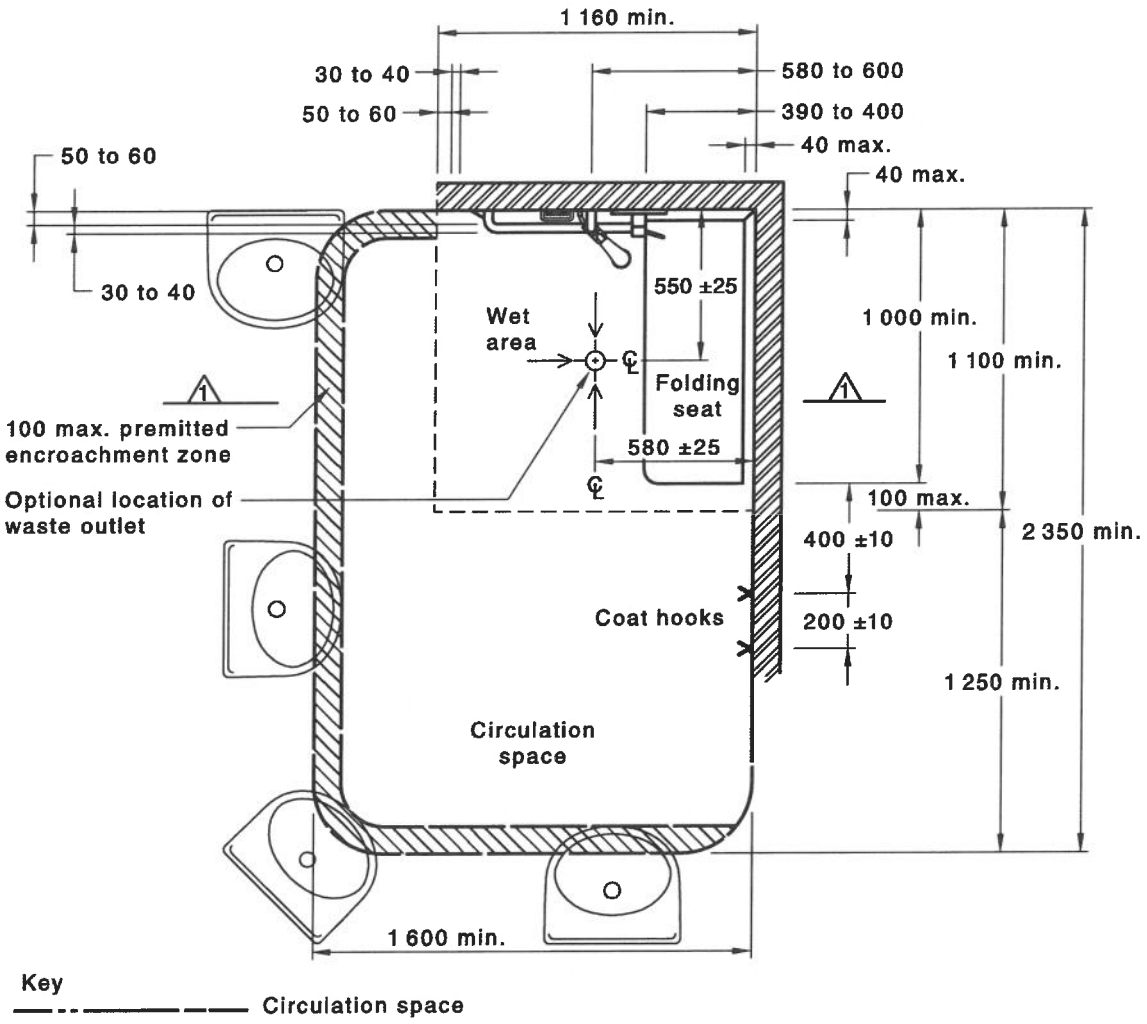
(b) Where a central waste outlet for the shower recess is provided, the waste outlet for the shower shall be in accordance with Figure 47. Alternatively, a linear drain may be provided.

(c) The slope of the floor of the shower recess to a central waste outlet shall have a gradient between 1 in 60 and 1 in 80 as shown in Figure 49. The slope of the floor of the whole sanitary facility to a linear drain shall be constant within the range of 1 in 50 and 1 in 90.

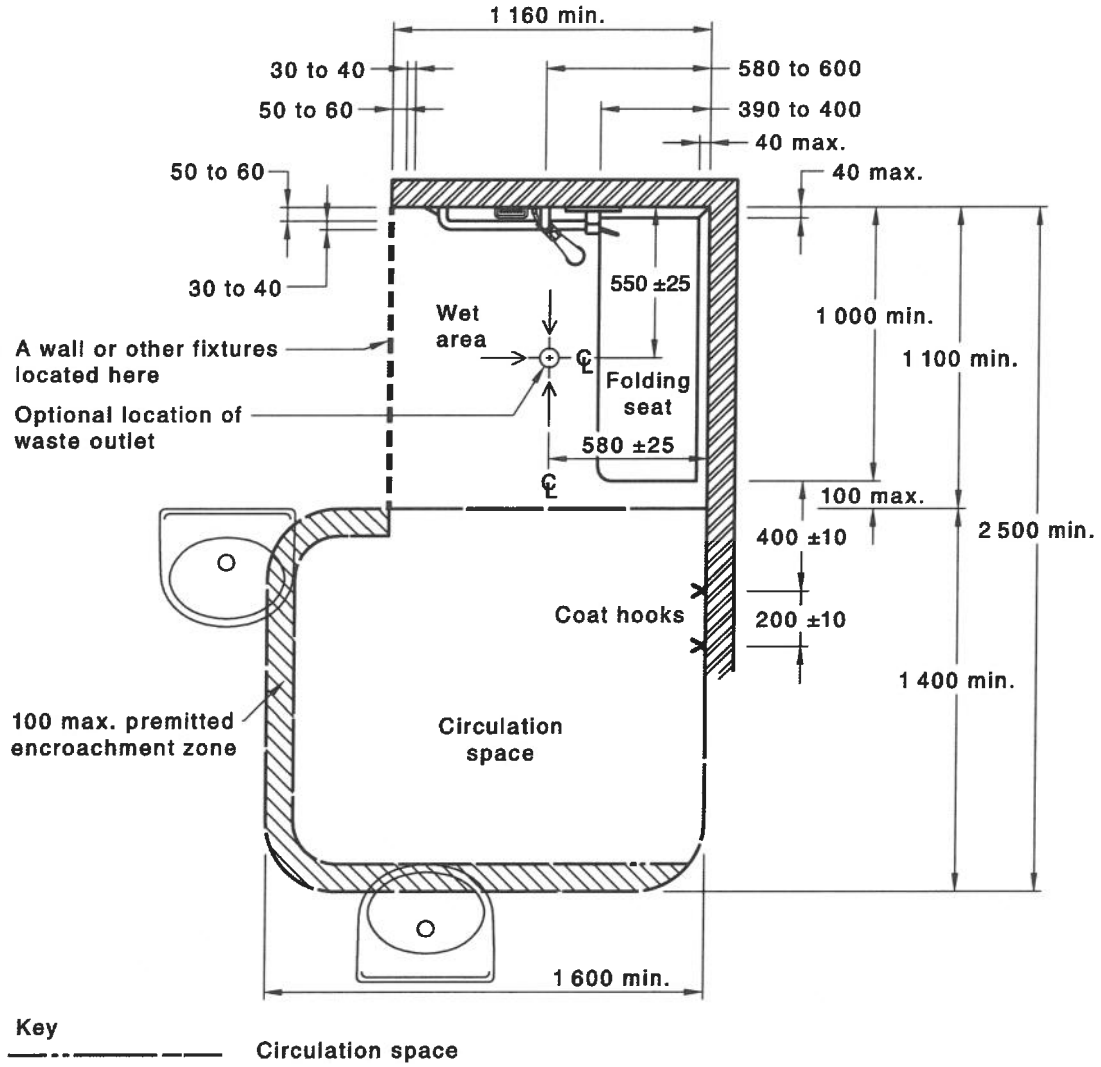
NOTE A linear drain may be used to facilitate conformance to these gradients.

(d) The slope of floor of the remainder of the sanitary facility shall have a gradient between 1 in 80 and 1 in 100, as shown in Figure 49.

Dimensions in millimetres



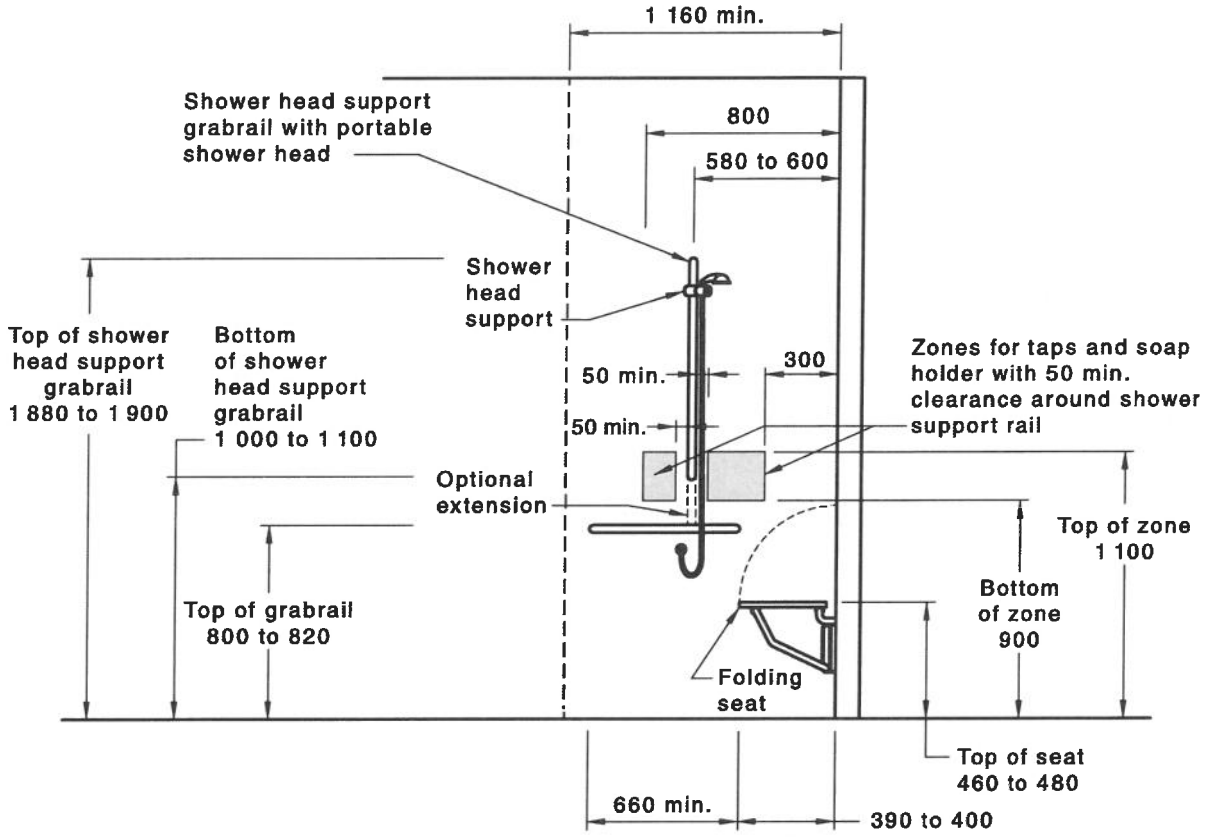
(a) Shower recess with two walls



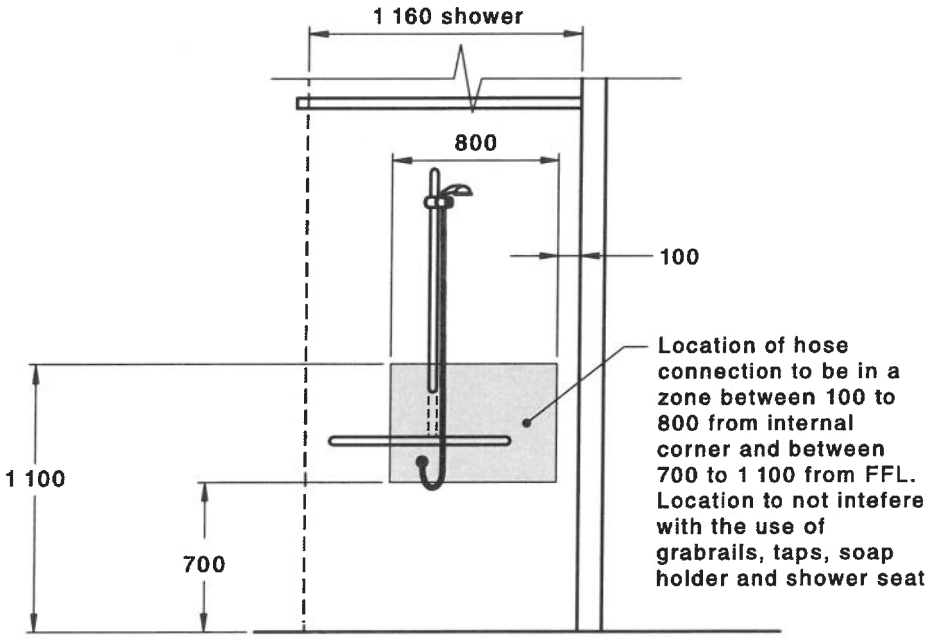
(b) Shower recess with a third side provided by a wall or other fixtures

Figure 47 — Shower recess and circulation space — Plan

Dimensions in millimetres



(a) Shower recess fittings



(b) Shower recess fitting — zone of hose connection

Figure 48 — Shower recess fittings — Elevation

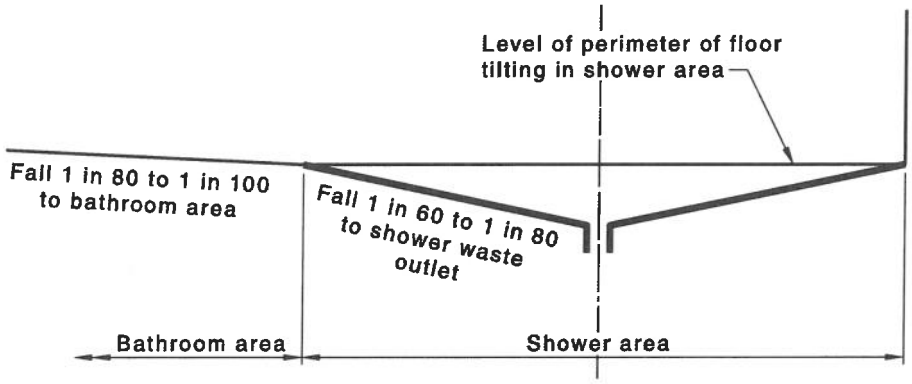


Figure 49 — Grades for bathroom and shower floors

12.5.3 Shower screens

The means of screening a shower recess shall be either by a curtain or a type of door system that does not obstruct the required circulation space or the shower recess.

12.5.4 Grabrails

Grabrails, as specified in Clause 14, shall be fixed on the walls in the positions shown in Figures 47 and 48. Taps, soap holder and shower head support grabrail, as shown in Figures 47 and 48 may encroach into the 600 mm clearance above the grabrail required by Clause 14(e).

Where the nominated dimensions of the required grabrails for WC and shower recess overlap the grabrail shall be continuous.

NOTE Where a continuous grabrail traverses the location of a shower curtain, the curtain should lay across the grabrail.

12.5.5 Shower head support grabrail

A shower head support grabrail, as specified in Clause 14, shall be fixed on the wall in the position shown in Figure 48.

12.5.6 Shower head and hose

A hand-held shower head shall be provided, which shall have a flexible hose of a minimum length of 1 500 mm.

An adjustable shower head holder shall be provided to support the shower head and shall —

(a) be installed on the shower head holder support grabrail as shown in Figure 48;

(b) allow the graspable portion of the shower head to be positioned at various angles and heights;

(c) The wall outlet for the shower hose shall be located at 700 mm to 1 100 mm AFL to provide full access for the independent user, when coupled with the required 1 500 mm minimum length hose. See Figure 48;

(d) allow the graspable portion of the shower head to be located at heights between 1 000 mm and 1 800 mm above the plane of the finished floor; and

(e) allow access and adjustment from a seated position.

NOTE Installation of water supply backflow prevention devices to prevent water supply contamination is covered by the NCC Volume 3.

12.5.7 Soap holder

The soap holder shall be located within the zone shown in Figure 48.

12.5.8 Shower taps

Shower taps, as specified in Clause 12.2.1, shall be located within the zone shown in Figure 48. The length of the tap lever handle shall be no greater than 100 mm.

12.5.9 Folding seat

A foldable seat shall be provided inside the shower recess, as shown in Figures 47 and 48, and shall —

(a) be self-draining;

(b) be slip-resistant;

(c) have front corners that are rounded to a radius of 10 mm to 15 mm;

(d) have top edges that are rounded with a minimum radius of 2 mm to 3 mm; and

(e) shall fold in an upwards direction and when folded the grabrail shall be accessible.

NOTE For assisted residential care buildings the provision of a portable shower chair may be provided in lieu of the folding seat.

Where drainage is provided by holes or slots in single unit seats or by gaps between slats in compound seats, the diameter of the holes, the width of the slots and the gaps between slats shall be between 4 mm to 6 mm.

The fastenings, materials and construction of the seat shall be able to withstand a force of 1 100 N applied at any position and in any direction without failing or loosening of fastenings.

12.5.10 Clothes hanging devices

Two clothes hanging devices shall be installed within reach of the shower seat, as shown in Figure 47.

12.5.11 Backflow prevention device and restrictor device

Unless the shower hose has a restrictor device preventing the shower head from resting on the floor or into the basin, a backflow prevention device will be required to prevent water contamination. Where it would be possible for the shower head to reach into the toilet pan then a restrictor device shall be fitted to prevent the hose reaching the toilet.

The restrictor device shall be a proprietary item which restricts the movement of the shower hose and prevents the shower head from reaching into the toilet pan, basin or onto the floor.

NOTE Installation of water supply backflow prevention devices to prevent water supply contamination is covered by the NCC Volume 3.

12.6 Combined sanitary facilities

Circulation spaces for combined sanitary facilities, including doors, may be overlapped.

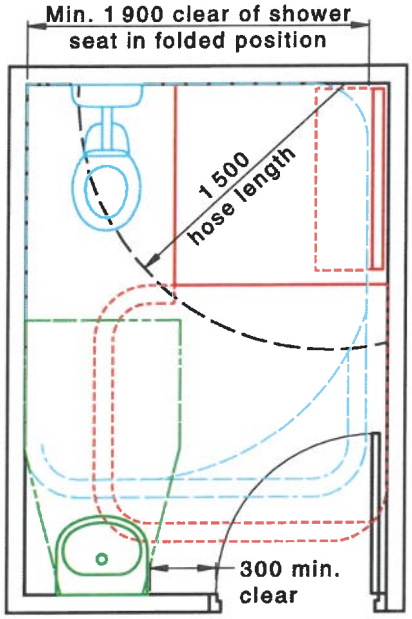
A washbasin may encroach up to 100 mm into the circulation spaces (see Clause 12.3.1).

Other nominated fixtures may encroach into circulation spaces (see Clause 12.2.8.1).

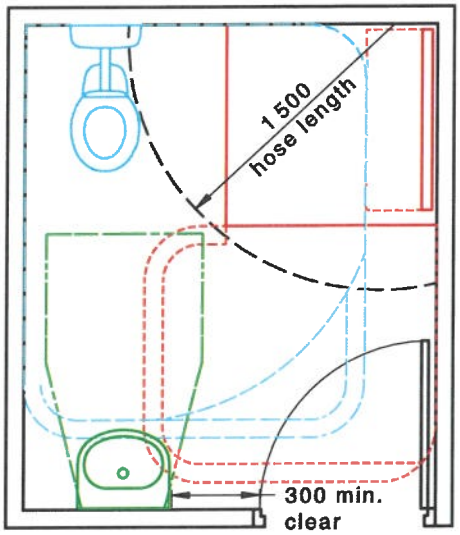
A shower seat in the folded-up position shall not encroach into circulation spaces.

Figures 50(A) and (B) shows examples of combined sanitary facilities, with and without a shower.

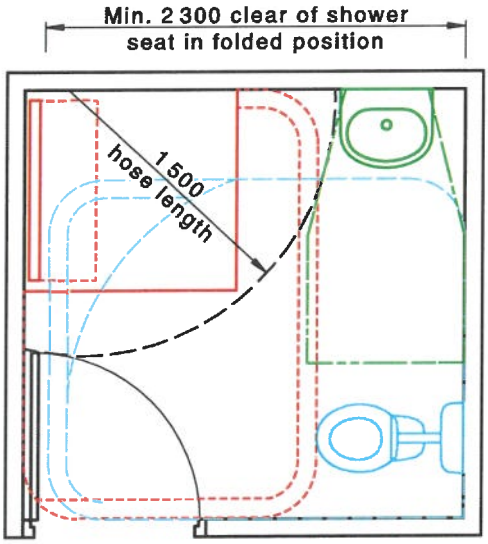
Dimensions in millimetres



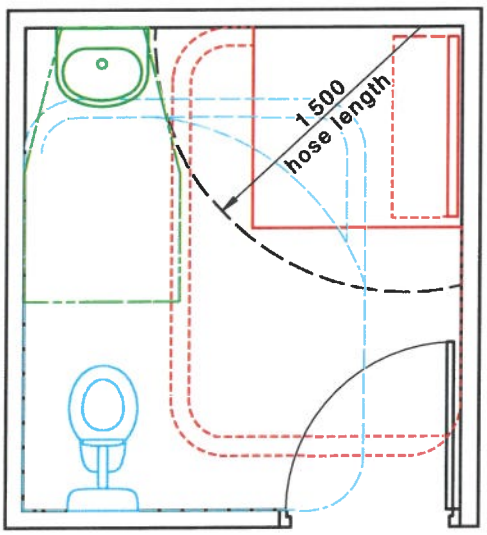
(a) Backflow prevention device and restrictor device required



(b) Backflow prevention device and restrictor device may be required based on hose location



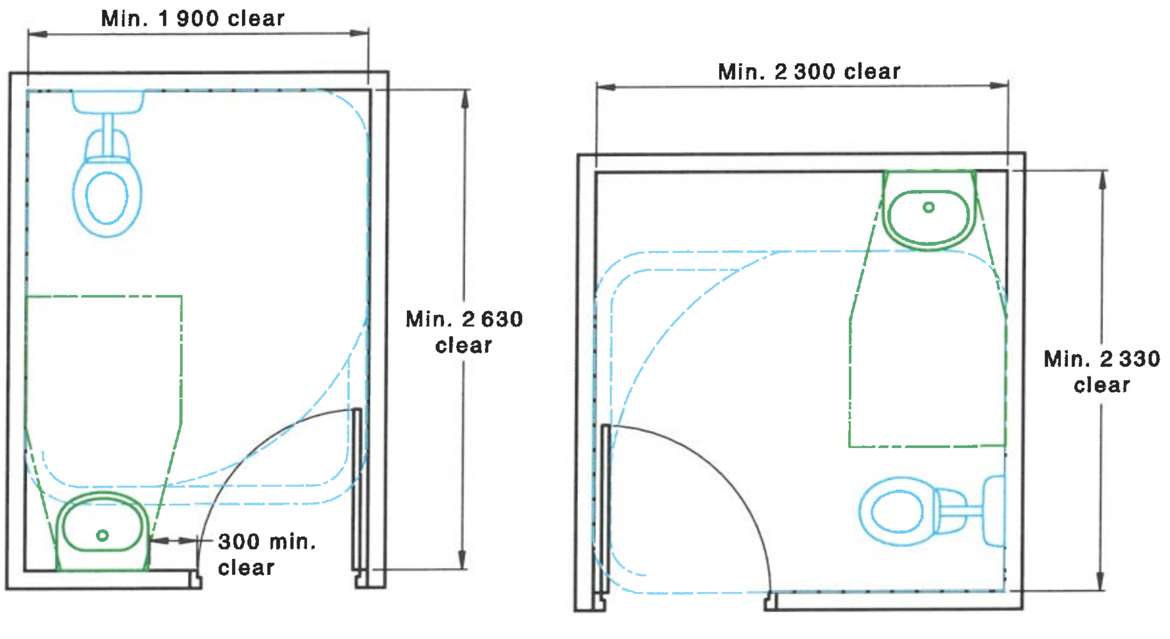
(c) Backflow prevention device and restrictor device not required



(d) Backflow prevention device and restrictor device not required

NOTE A backflow prevention device may be required if the hose is longer than 1 500 mm.

Figure 50(A) — Examples of accessible bathrooms

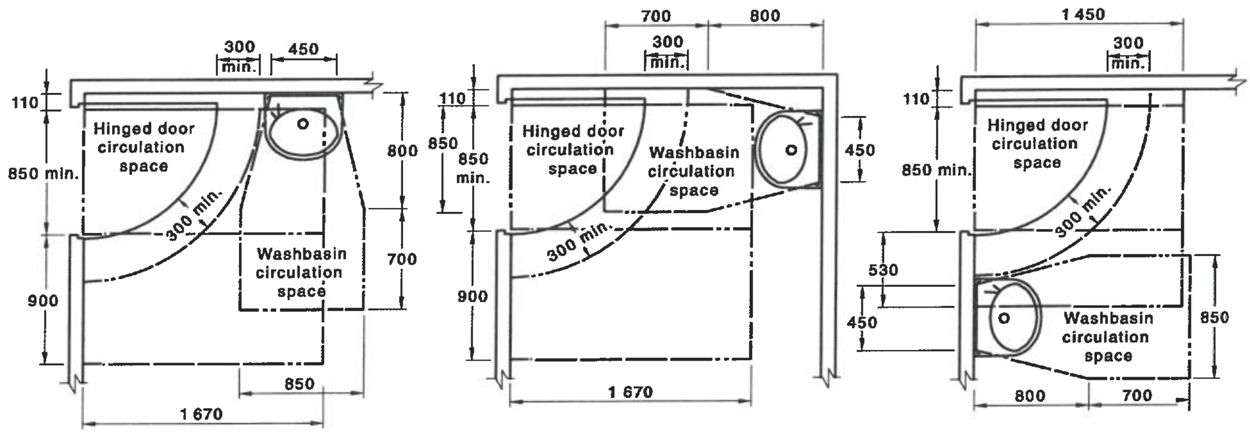


(a) Accessible toilet

(b) Accessible toilet

Figure 50(B) — Examples of accessible toilets

Dimensions in millimetres



(a) Side approach

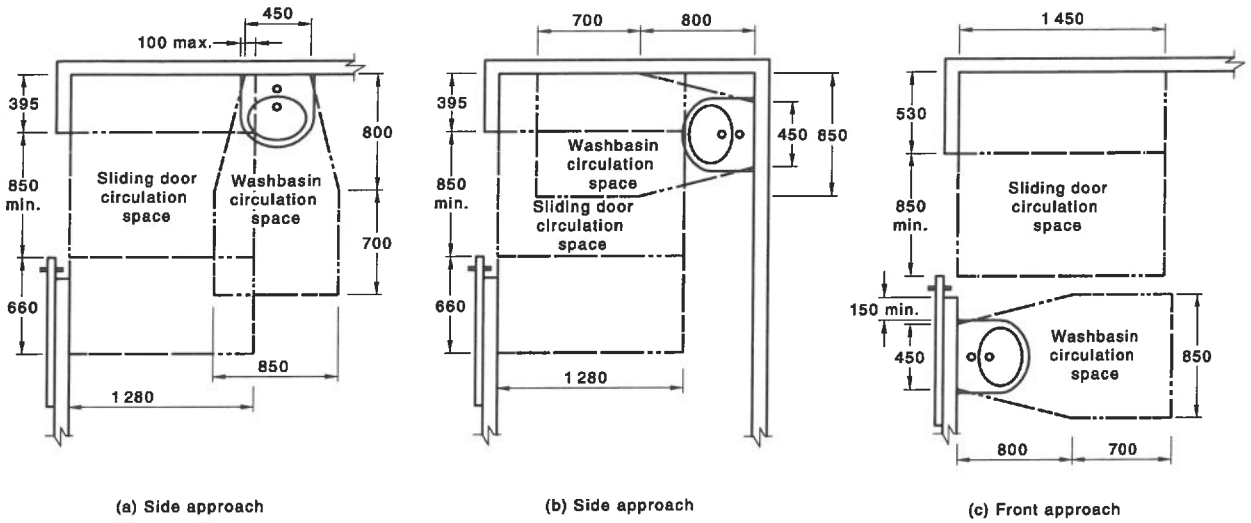
(b) Side approach

(c) Front approach

NOTE It is not required to align the knee/toe clearance with the wall surface.

Figure 51(A) — Allowable encroachment of a washbasin into hinged door circulation space

Dimensions in millimetres



(a) Side approach (b) Side approach (c) Front approach

NOTE It is not required to align the knee/toe clearance with the wall surface.

Figure 51(B) — Overlap of washbasin fixture into door circulation space where washbasin is located opposite a sliding door

Section 13 Sanitary compartment for people with ambulant disabilities

13.1 General

Sanitary compartment for people with ambulant disabilities shall be in accordance with Figures 52(A) and 52(B).

WC shall have a vertical height of 460 mm to 480 mm to the top of the seat and be installed with the standard projection for the front of the WC pan.

NOTE When setting out works using the dimensions in this section, make appropriate allowances for construction tolerance (see Section 2).

13.2 Grabrails

Grabrails shall be continuous and consist of a horizontal section plus either a vertical section or an upward angled section as shown in Figure 53(A).

For further requirements on grabrails see Section 14.

13.3 Doors

Doors to sanitary compartments for people with ambulant disabilities shall have openings with a minimum clear width of 700 mm and be in accordance with Figure 34 (b) and Figure 53(B).

Doors shall be provided with an in-use indicator and a bolt or catch. Where a snib catch is used, the snib handle shall have a minimum length of 45 mm from the centre of the spindle. In an emergency, the latch mechanism shall be openable from the outside.

13.4 Signage

Sanitary compartments for people with ambulant disabilities shall be identified by symbols and words, as specified in Clause 5 and illustrated in Figure 9 (c).

13.5 Clothes hanging device

A clothes hanging device shall be provided within the sanitary compartment and at a height between 1 350 mm to 1 500 mm from the floor.

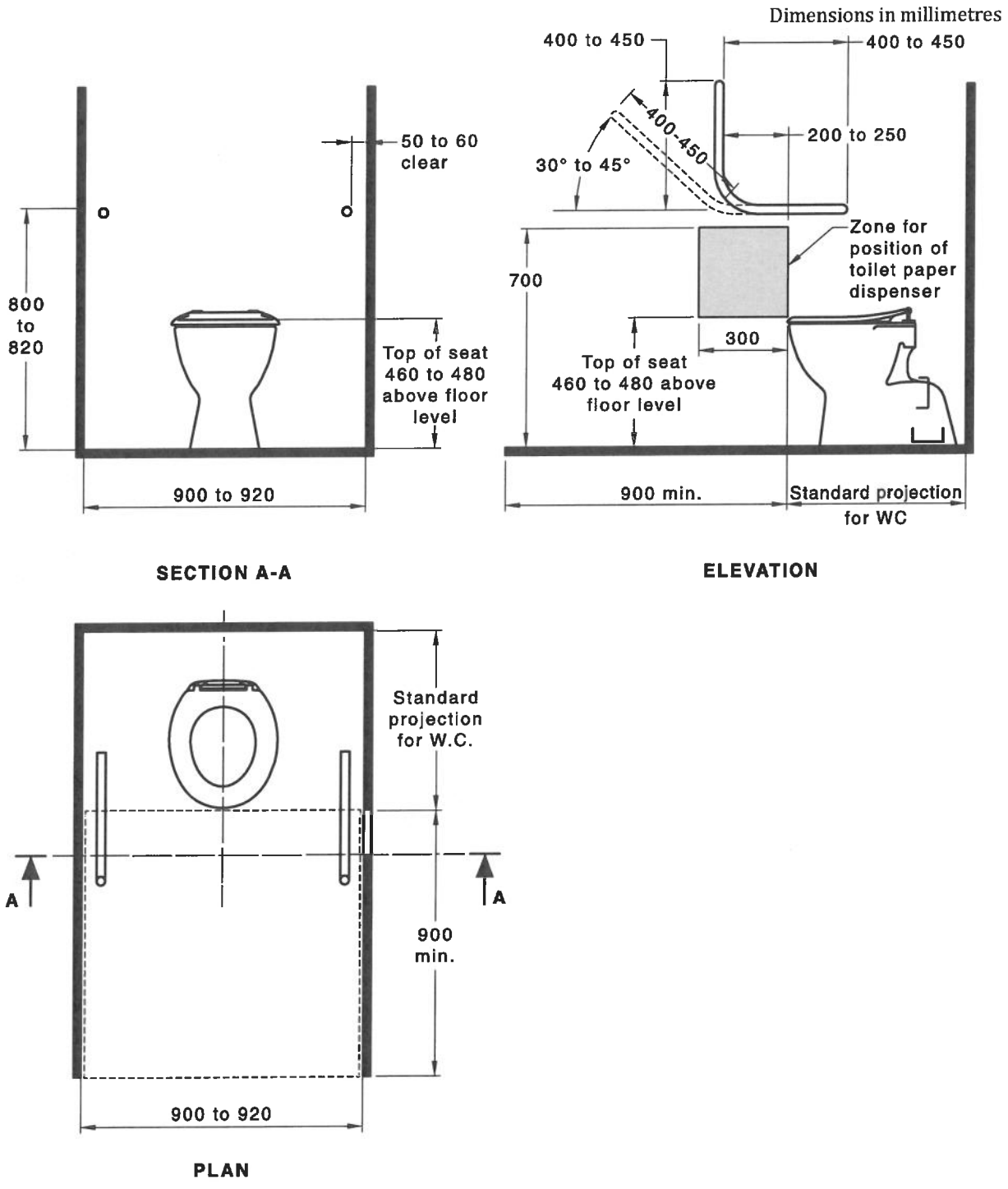


Figure 52(A) — Sanitary compartment for people with ambulant disabilities — Plan and elevation

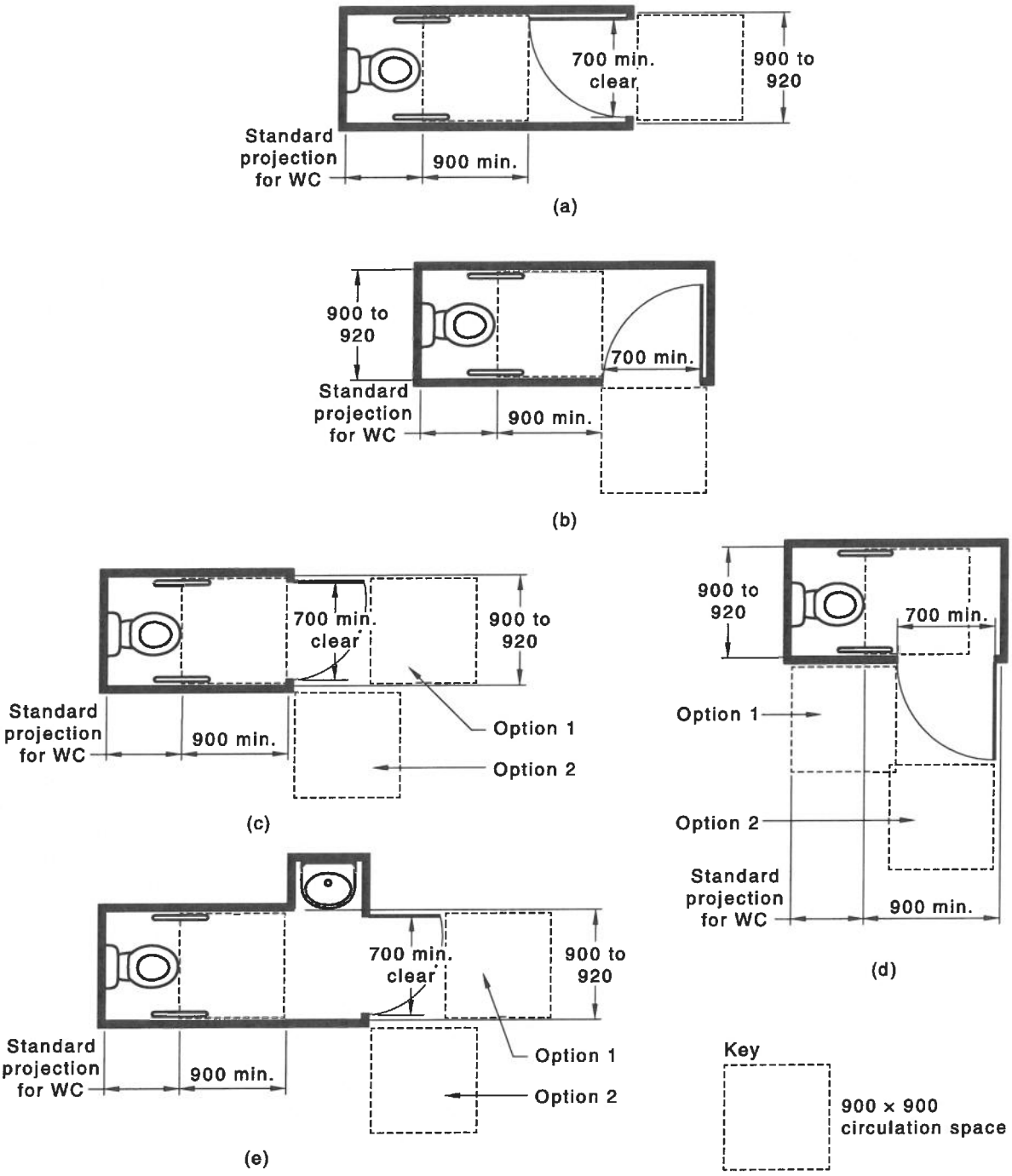


Figure 52(B) — Sanitary compartment for people with ambulant disabilities — Doorway options

Section 14 Grabrails

Grabrails shall be in accordance with the following:

(a) Grabrails shall be not less than 30 mm and not more than 40 mm outside diameter; or they shall have a sectional shape within the limits of 30 mm to 40 mm diameter.

(b) Exposed edges and corners of grabrails shall have a radius of not less than 5 mm.

(c) The fastenings and the materials and construction of grabrails shall be able to withstand a force of 1 100 N applied at any position and in any direction without deformation or loosening or rotation of the fastenings or fittings.

(d) The clearance between a grabrail and the adjacent wall surface or other obstruction shall be not less than 50 mm and not more than 60 mm. The clearance above a horizontal grabrail shall extend above the top of the grabrail by not less than 600 mm. The clearance below a horizontal or angled rail shall be a minimum of 50 mm except at fixing points.

(e) Grabrails shall be fixed so that there is no obstruction to the passage of the hand along the top 270° arc of horizontal and angled grabrails. There shall be no obstruction to the passage of the hand for the full length of vertical grabrails.

NOTE An exposed end of a grabrail is a potential hazard.

Section 15 Assembly buildings

15.1 Wheelchair seating spaces

Where fixed seating is provided, wheelchair seating space shall be as follows:

(a) Adjacent to, and on the same level as, other seating in the row and shall be accessed by a continuous accessible path of travel.

(b) Located to allow lines of sight comparable to those for general viewing areas and shall not be obstructed by opaque handrails or balustrades.

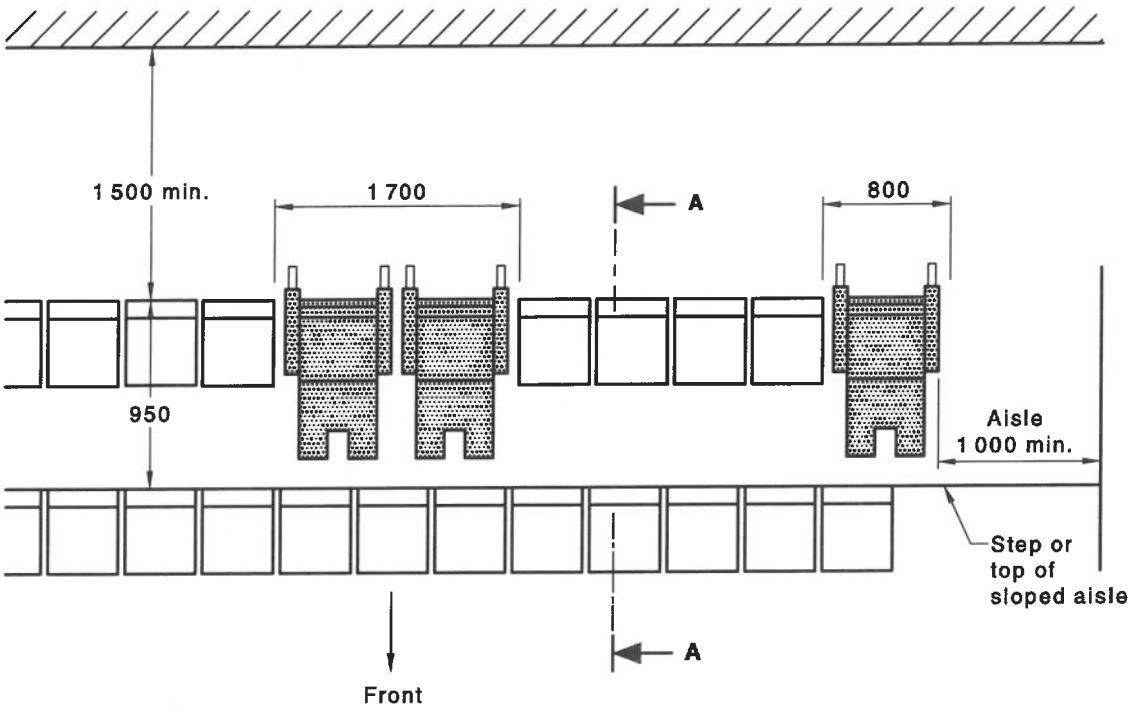
NOTE Wheelchair seating spaces may be achieved by providing removable seating.

15.2 Surfaces

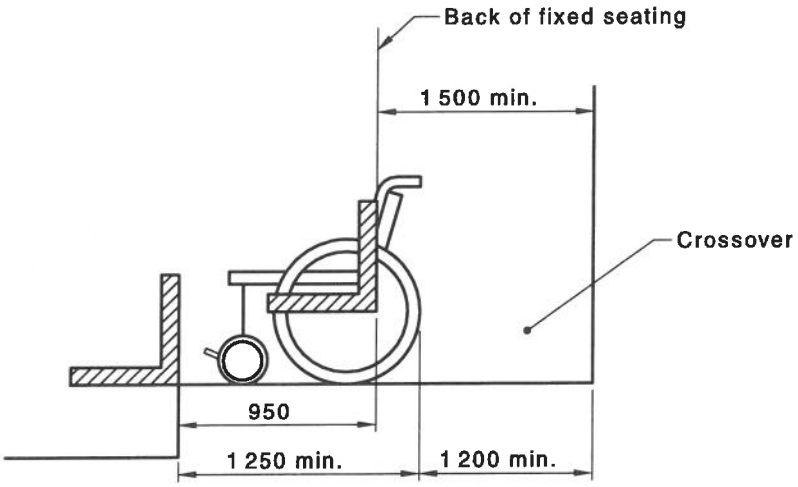
The ground or floor at wheelchair seating spaces shall be level when indoors or have a gradient not steeper than 1 in 40 in outdoor areas.

15.3 Spatial requirements

The minimum space for each wheelchair shall be as shown in Figure 53(A). The whole of the space allocated for any wheelchair shall not impinge on the dimensions required for aisles by more than 250 mm, or for crossovers by more than 300 mm. See Figures 53(B), 53(C), 53(D) and 53(E).

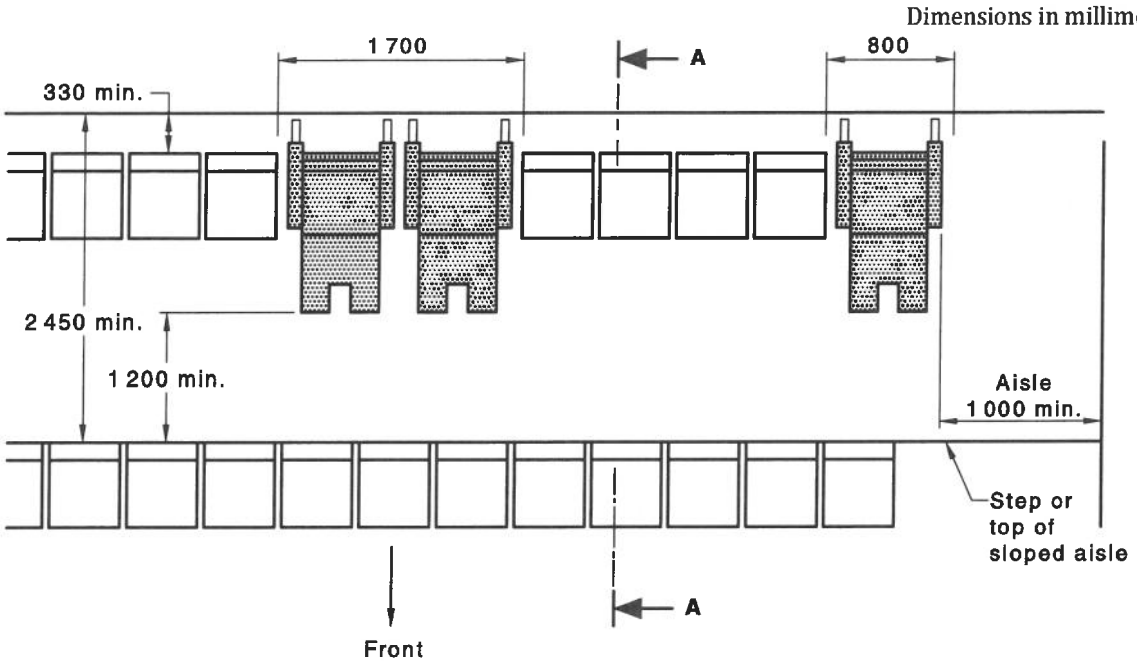


PLAN — APPROACH FROM THE REAR

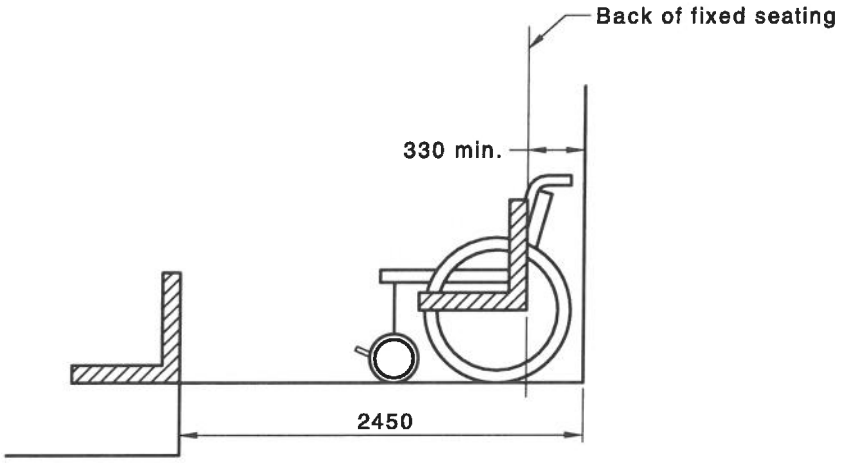


SECTION A-A

Figure 53(A) — Wheelchair seating spaces in auditoria with aisles and crossovers — Approach from the rear



PLAN — APPROACH FROM THE FRONT



SECTION A-A

Figure 53(B) — Wheelchair seating spaces in auditoria with aisles and crossovers — Approach from the front

Dimensions in millimetres

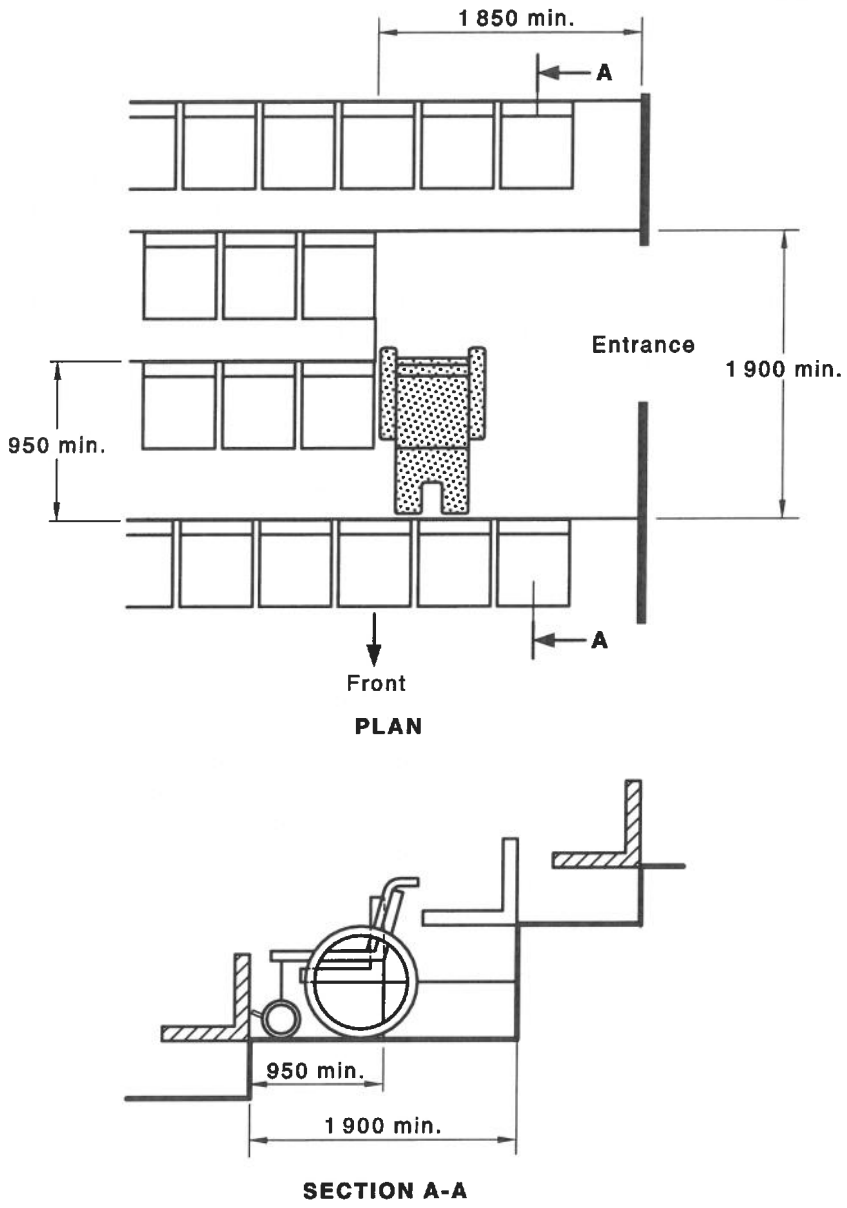
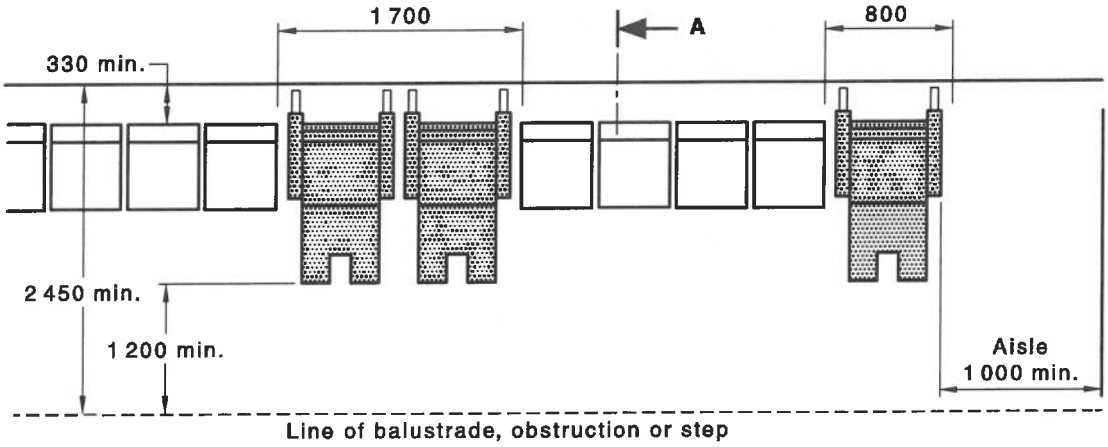
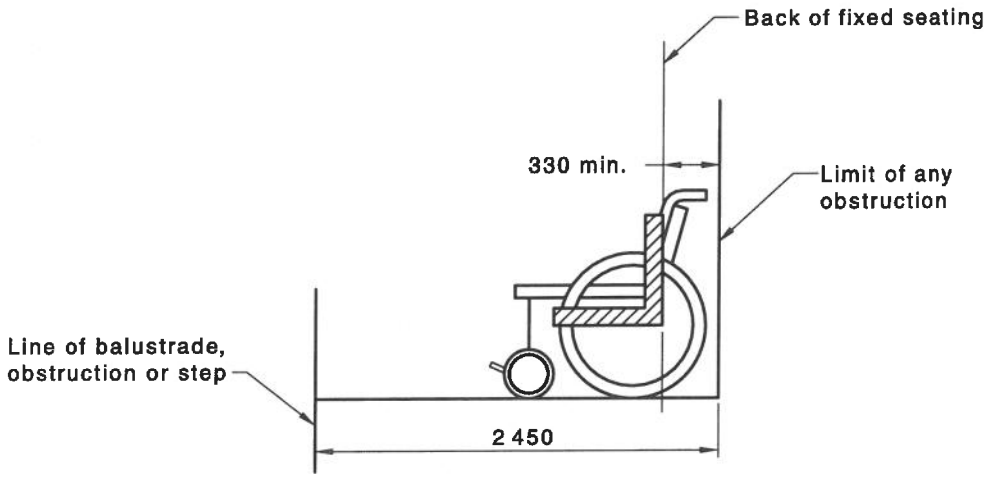


Figure 53(C) — Wheelchair seating spaces in auditoria with continental seating (i.e. no aisles or crossovers)



PLAN — APPROACH FROM THE FRONT



SECTION A-A

Figure 53(D) — Wheelchair seating spaces in auditoria front row — Approaching from the front

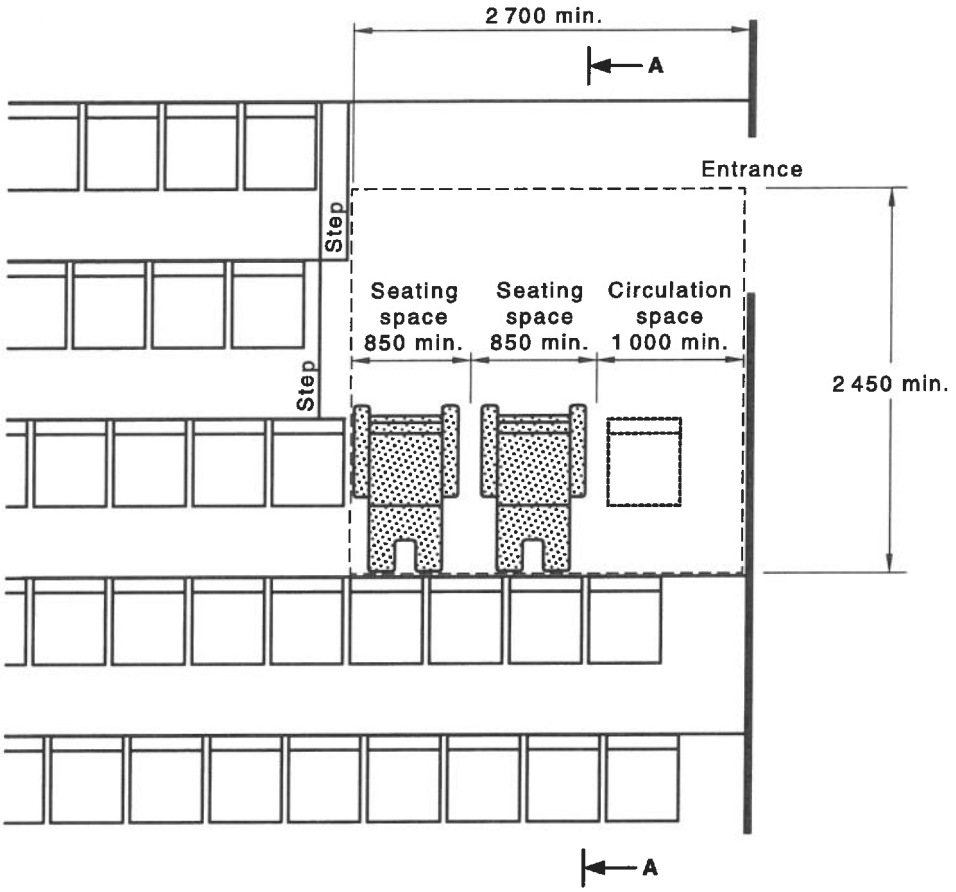


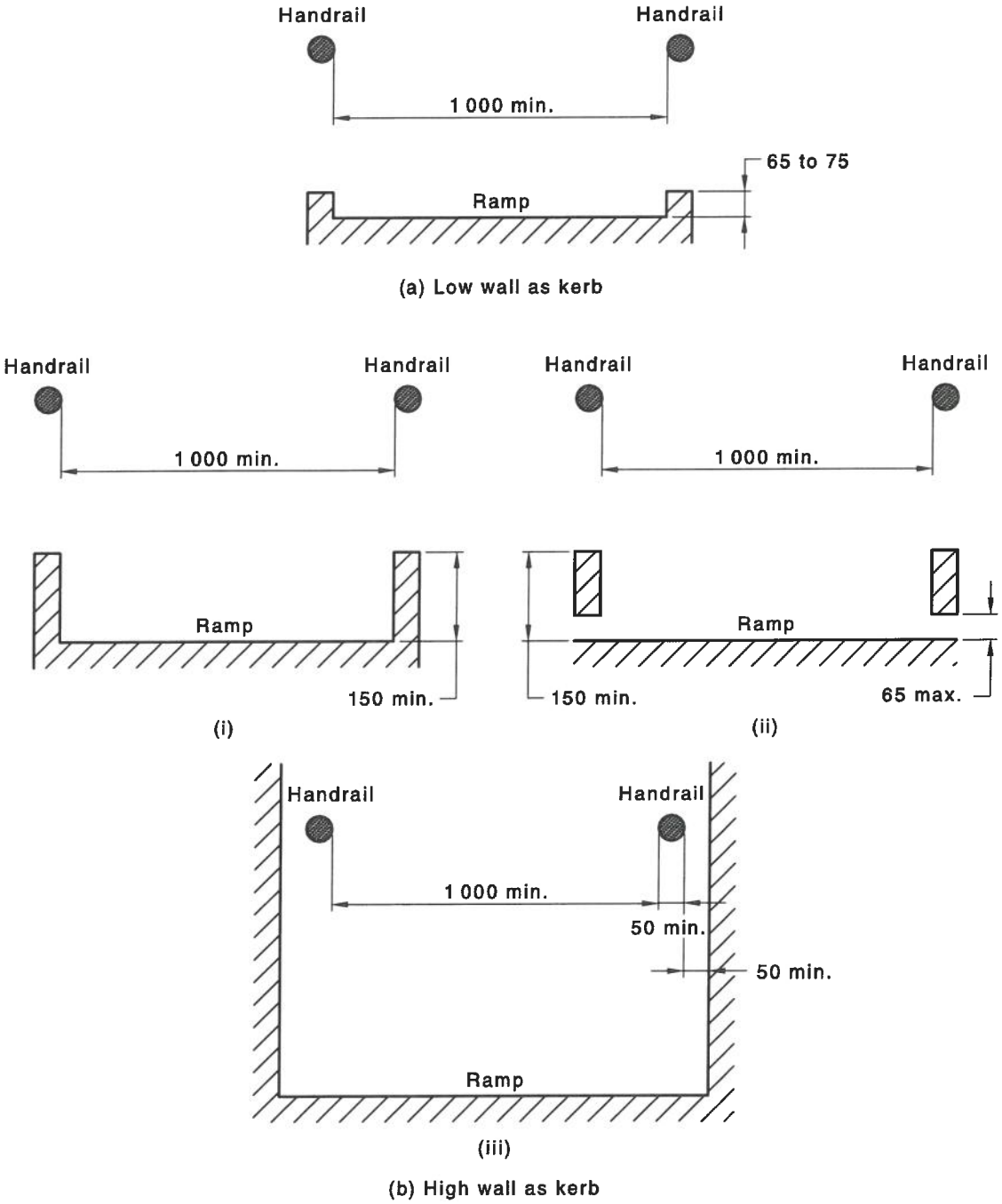
Figure 53(E) — Paired wheelchair seating spaces in auditoria with continental seating or where there are no crossovers

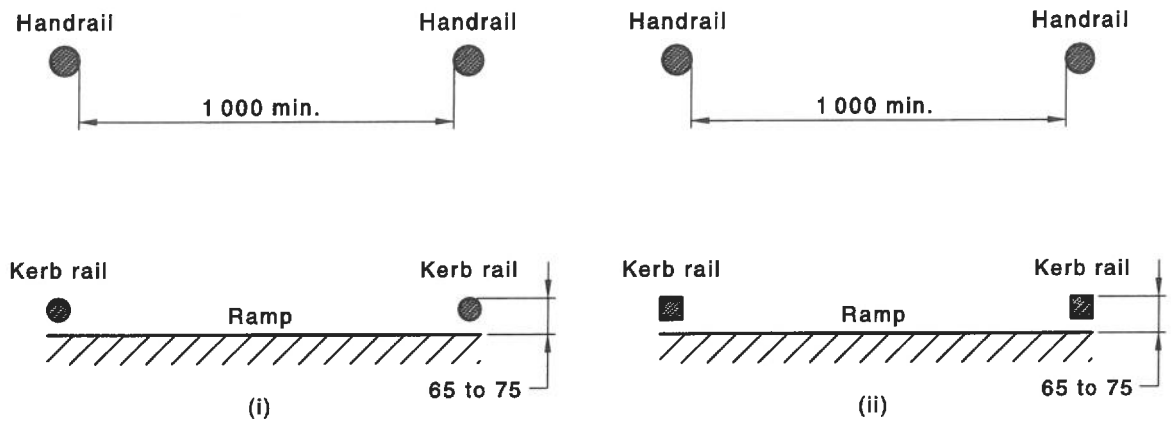
Appendix A
(informative)

Examples of kerbs

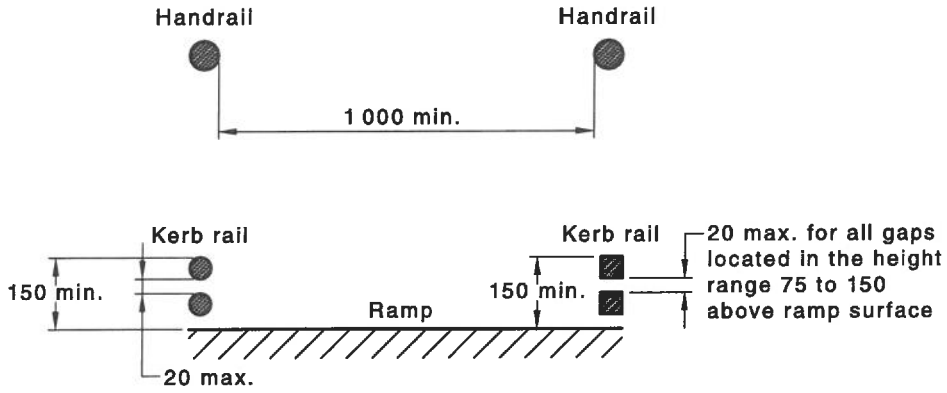
This Appendix provides kerb and handrail configurations, as shown in Figure A.1, to enable conformance to the requirements of Clause 7.3(j).

Dimensions in millimetres





(c) Single rail as kerb



(d) Multiple rail as kerb

Figure A.1 — Types of kerbs

Appendix B
(informative)

Measurement of luminance contrast between building elements

B.1 General

This appendix sets out two methods for measuring the luminance contrast between building elements — contact method or non-contact method.

Where it is necessary to achieve sufficient luminance contrast between building elements, this can usually be achieved by using very dark or very light materials. The luminance contrast is achieved by measuring the luminous reflectance of the first building element and comparing it with the luminous reflectance of the second building element, as set out in Clauses B.3 and B.4 or B.5.

B.2 Luminance contrast requirements

Luminance contrast between building elements is the difference in the amount of light reflected (luminance reflectance) from the 1st building element compared to the amount of light reflected from the 2nd building element.

The first building element should have a minimum luminance contrast of 30 % compared to the amount of light reflected from the second building element.

It may be necessary to test both elements when wet and dry.

The test to be conducted may be carried out in the contact method or non-contact method, and for published results to then be compared.

B.3 Measurement of luminance contrast — Non-contact method

B.3.1 General

This clause sets out a method for measuring the luminous reflectance of building elements. The method is carried out with reference to a standard light source, which is an inherent feature of suitable colorimeters and spectrophotometers.

NOTE 1 Some building materials manufacturers publish luminous reflectance values for each of their products.

This test method is not suitable for measuring the luminous reflectance of translucent materials or illuminated objects. It is less applicable where the measured surface is not uniformly coloured.

NOTE 2 The method specifies colorimeters and spectrophotometers that are widely available.

B.3.2 Instrumentation

A tristimulus colorimeter, or spectrophotometer with a diffuse illumination/normal viewing (d/o) geometry, is used with CIE Standard Illuminant D65. The instrument should be measuring absolute CIE for Y_{xy} to be calculated. The measured luminous reflectance is defined by the tristimulus value Y. The chromaticity coordinates x and y provide an indication of the colour.

B.3.3 Procedure

The procedure is as follows:

(a) Calibrate the equipment in accordance with the design specification.

(b) Locate the equipment on the surface to be measured.

(c) Take measurements in at least five locations (on each building element) or on five units of the product (such as samples, where five units are available). Where the surface does appear (visually) to be uniformly coloured, a minimum of 10 measurements have to be taken. Record the luminous reflectance (Y value) for each individual dry measurement that is taken. The luminous reflectance (Y value) of the CIE 1964 colour system is recognized in AS/NZS 1580.601.2.

(d) Unless wet measurements are deemed to be inappropriate, wet the surface of the product and ensure that the surface remains wet (such that water ponds on the surface) for a minimum of 5 min. Take measurements as in Step (c), as soon as possible after removing any unabsorbed water from the surface with a cloth or sponge that does not leave any solid residue. Record the luminous reflectance (Y value) for each individual wet measurement that is taken.

Determine the mean dry luminous reflectance (Y_d) and the mean wet luminous reflectance (Y_w).

NOTE 1 The use of standardized illumination conditions when making photometer measurements can enable manufacturers to publish luminous reflectance values that are consistent with those obtained using this Appendix.

NOTE 2 For standard colours, see AS 2700.

The luminance contrast (C) of two surfaces has to be calculated using the Bowman–Sapolinski equation as follows:

$$C = 125\,(Y_2 - Y_1)/(Y_1 + Y_2 + 25)$$

where

C = luminance contrast

Y_1 and Y_2 = luminous reflectance values of the two surfaces

For more information, refer to *An Improved Metric for Visual Differentiation using Colour-modified Clinical Eye Charts*, Sapolinski, J.

B.3.4 Report

The following should be reported:

(a) Full description of the surfaces tested with product details where known.

(b) The instrument geometry, the light source as being D65, the aperture and the observer angle.

(c) The locations of the measurements on the sample.

(d) The mean luminous reflectance of the building elements under the conditions set out in Clause B.3.3.

The corresponding data for other light sources and illuminant may also be reported.

B.4 Determination of luminance contrast

This clause sets out a method for using the luminous reflectance values to calculate the luminance contrast between two adjacent or contiguous surfaces when the luminous reflectance of the products are known, and is based on the following equation:

$$C = 125\,(Y_2 - Y_1)/(Y_1 + Y_2 + 25)$$

where

C = luminance contrast

Y_1 = darker surface

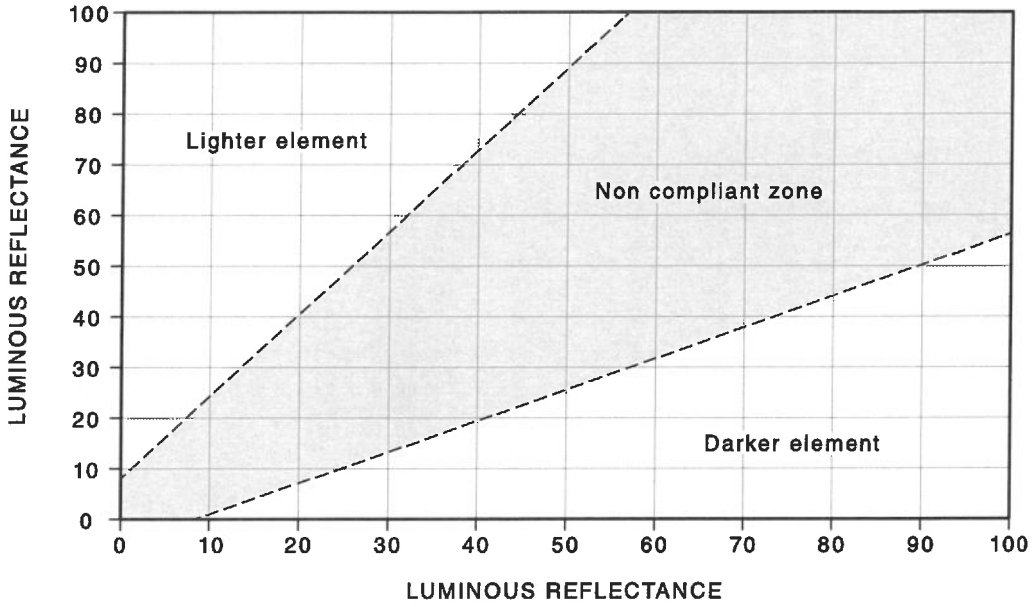
Y_2 = lighter surface

The full set of limits is shown in Table B.1.

The luminous reflectance of the building elements should lie above or below the lines illustrating the minimum and maximum luminous reflectance necessary, as shown in Figure B.1.

Table B.1 — Values of luminous reflectance required to provide adequate luminance contrast as a function between building elements

Luminous reflectance of the building element	Minimum luminous reflectance of a possible lighter building element	Maximum luminous reflectance of a possible darker building element
95	—	53
90	—	50
85	—	47
80	—	44
75	—	41
70	—	38
65	—	35
60	—	31
55	96	28
50	90	25
45	82	22
40	74	19
35	65	16
30	57	13
25	49	10
20	41	7
15	33	4
10	25	1



NOTE Luminous reflectance of building elements should lie outside the shaded area, with the lighter element above the shaded area and the darker element below the shaded area.

Figure B.1 — Limiting values of luminous reflectance of building elements

B.5 Measurement of luminance contrast — Contact method

B.5.1 General

This clause sets out the method for on-site measurement of contrast of building elements. This method is carried out under the prevailing lighting condition(s) and is also applicable where a building element is not uniformly coloured.

NOTE The method specifies a luminance meter (photometer) with a 1° measurement field. Such meters are widely available. While a wider field of view such as 3° may be preferable because it permits a shorter measurement distance, luminance meters with wider fields are less common and substantially more expensive.

B.5.2 Instrumentation

A single lens reflex luminance meter commonly known as a photometer with a 1° measurement field and a spectral responsivity approximating the CIE 1931 Standard Observer V (λ) function as specified in ISO/CIE 11664-1 should be used.

B.5.3 Procedure

The procedure is as follows:

(a) Mount the luminance meter on a tripod so that the centre of the objective lens is at a height of 1.6 ± 0.1 m (representative of the eye height of a standing person).

(b) Locate the tripod so that measurements can be made of both building elements without moving the tripod. Direct the luminance meter to the point where the width of the smaller building element just fills the measurement field. Choose an area that is visually uniformly lit. Record the luminance L_1.

(c) Direct the luminance meter to measure the second building element immediately adjacent to the location of the first building element. Record the luminance L_2.

(d) When calculating the contrast between the building elements use the following equation:

$$C = 125\,(Y_2 - Y_1)/(Y_1 + Y_2 + 25)$$

where

C = luminance contrast

Y_1 = darker surface

Y_2 = lighter surface

Conformance is established using C as appropriate.

(e) To carry out wet measurements take measurements in at least 5 locations (on each building element) or on five units of the product (such as samples where 5 units are available). Where the surface does not appear (visually) to be uniformly coloured, a minimum of 10 measurements have to be taken. Record the luminance reflectance (L value) for each individual dry measurement that is made. The luminance reflectance (L value) of the CIE 1964 colour system is recognized in AS/NZS 1580.601.2.

(f) Unless wet measurements are deemed to be inappropriate, wet the surface of the product and ensure that the surface remains wet (such that water ponds on the surface) for a minimum of 5 min. Take measurements as in Step (c) as soon as possible after removing any unabsorbed water from the surface with a cloth or sponge that does not leave any solid residue. Record the luminous reflectance (Y value) for each individual wet measurement that is taken. Determine the mean dry luminous reflectance (L_d) and the mean wet luminous reflectance.

NOTE 1 The use of standardized illumination conditions when making photometer measurements can enable manufacturers to publish luminous reflectance values that are consistent with those obtained using this Appendix.

NOTE 2 For standard colours, see AS 2700.

B.5.4 Report

The following should be reported:

(a) Full description of the building elements with product details where known.

(b) The instrument being a luminance meter with a 1° measurement area corrected to approximate the CIE 1931 Standard Observer.

(c) The location of the sample, if on-site.

(d) The location of the sample of the measurements on the first building element.

(e) A description of the light source(s) illuminating the sample, including type, e.g. fluorescent tube, incandescent, high pressure sodium discharge, metal halide, and colour (in general terms).

(f) The mean luminance reflectance of the second building element to the first building element under the conditions set out in Clause B.5.3.

(g) The mean luminance reflectance of the first building element to the second building element under the conditions set out in Clause B.5.3.

(h) The luminance contrast with the second building element.

(i) Where the lighting source varies, e.g. by night and day, the corresponding data for other light sources may also be reported.

Appendix C
(informative)

Vision impairment

C.1 Understanding vision impairment

Vision impairment is defined as a "limitation of one or more functions of the visual system" (1). It can present itself in a variety of ways and be caused by simple or complex pathological processes affecting a person's daily living activities.

Vision impairment may affect partial or full loss of sight in one or both eyes and can be the result of disease or injury, may progress overtime, and may be permanent or corrected with visual aids (such as glasses) or with surgery.

According to the Australian Bureau of Statistics (ABS) 2017–18, more than 13 million Australians (55 % of the total population) have one or more long-term eye conditions. It also stated that long-term vision disorders affected 93 % of people aged 55 and over. (2)

The effects of vision impairment may be further exacerbated by coexisting general health conditions, environmental impacts, including weather conditions or level of ambient light, and the visual demands of the task at hand. Understanding the different visual functions may aid in applying strategies to reduce their impact on a person's quality of life and improve accessibility of normal daily activities.

Functions of the visual system include but are not limited to the following:

C.2 Visual acuity

Visual acuity can be defined as the ability of a person to resolve detail or the sharpness/clarity of one's vision. The measurement of visual acuity involves a person reading a standardised set of black high contrast symbols, typically letters or numbers, on a white background at a set distance. While visual acuity is useful as a measure of central vision it does not always correlate well with the quality of vision in challenging situations such as objects that are similar in brightness to their surrounds or moving/changeable shapes. Visual acuity is usually presented as a fraction such as 6/6 in Australia (20/20 in the US/UK) and if a person identifies this level of vision then they are considered to have normal vision. Presenting text or environmental signage in a larger font or size can compensate for a reduction in visual acuity.

C.3 Visual fields

While visual acuity measures the clarity of the central vision, visual fields are a measure of the extent of the peripheral or side vision. So while some people have very good visual acuity they may have poor or reduced peripheral vision resulting in "tunnel vision" or missing area. Visual field restrictions can impact activities such as driving, crossing the road or even just navigating through obstacles in a room. Normal visual field is considered to have a horizontal extent of 160° to 200° and about 135° vertically. Using a standard or continuous layout of design features can improve usability for a person with a restricted visual field.

C.4 A note on legal blindness

Legal blindness is defined as having the best achievable visual acuity of less than 6/60 in the better eye and/or visual field restriction to within 10 degrees radius from where a person is looking. (1)

This means that an individual who is deemed as legally blind can only see, at six metres (or closer), something that someone with 'normal' vision would be able to see at 60 m, or that the extent of their side vision is 10° away from where they are looking at best. A major limitation of legal blindness is that it does not take into account the other functions of the visual system discussed below.

C.5 Contrast sensitivity

Contrast sensitivity is the ability to discriminate between similar shades. It is a measure of how much colour or brightness difference is required for an object to be distinguished from its surrounds. The measurement of Contrast Sensitivity involves a person reading a standardised set of initially black high contrast symbols reducing to very faint low contrast symbols, typically letters, on a white background at a set distance. Individuals with low contrast sensitivity may have difficulty navigating environmental features such as unmarked curbs and steps, and may need enhanced illumination to read. Adding or improving the lighting used for different tasks and the addition of luminance contrast to the environment (such as adding nosing to the edge of steps or a visual indicator on glazing) can help in compensating for reduced contrast sensitivity.

C.6 Luminance contrast

AS 1428.1:2009 defines luminance contrast as "the light reflected from one surface or component, compared to the light reflected from another surface or component", it relates to the difference in the light reflective properties of each colour/surface. Improving luminance contrast in the environment supports many vision impairments.

C.7 Depth perception

Distance perception refers to the ability to see and recognize distances between people/objects. It allows us to accurately and quickly estimate the distance from oneself to a particular object, as well as distances between specific objects in any direction or angle. Depth perception refers to the ability to see and estimate the distance straight ahead toward a specific object. Doing this accurately requires stereopsis, or two eyes that see well and work together as a team. Depth perception is reduced when there is loss of visual contrast. People with vision in only one eye, or with normal vision in one eye and reduced vision in the other, will have reduced/no stereopsis (and hence reduced/no depth perception). When depth perception is reduced or not available, an individual must rely on other visual information to gain information about distances.

The loss of depth perception or the ability to perceive distance can affect a person's life in many ways, such as difficulty in navigating stairs. The addition of luminance contrast to the environment can help to compensate for loss of depth/distance perception.

C.8 Glare sensitivity

Glare and light sensitivity are common issues, particularly in individuals with eye conditions such as albinism, cataract, glaucoma and retinal disease. There are 2 types of glare: discomfort glare and disability glare. Discomfort glare causes a natural desire to look away from a bright light source, or creates difficulty in seeing a task (such as when driving towards the setting sun). Disability glare reduces the visibility of objects due to scattering of light within the eye, and does not necessarily cause discomfort.

Assessment of sensitivity to glare may be performed both indoors and outside with attention to different lighting environments which may be problematic (such as fluorescent lighting in grocery store).

Special optical filters (including sunglasses, varying tints) and non-optical devices such as hats, visors and UV shields, may help to reduce glare and thus improve comfort and visibility. Careful consideration of environmental lighting sources and reflectiveness of surfaces can reduce environmental glare.

C.9 Colour vision

Colour vision deficiency can be defined is the inability to distinguish certain shades of colour. The term "colour blindness" is often used in everyday speech to describe the same concept, although complete colour blindness is very rare. Colour vision deficiency can be inherited or acquired as a result of a disease process. The extent of the deficiency ranges from mild to severe and most commonly affects shades of reds/greens with blues/yellows being less common.

In Australia, the incidence of Colour Deficiency is 1:12 for males (8 %) and 1:200 (.04 %) for females. (3)

While most people who have inherited colour vision related deficiency have learned to live with this problem, it is those who have the acquired form who may have greater difficulty, especially as they typically have to deal with the concurrent impacts of the underlying cause of the colour vision impairment. Daily tasks can rely on a person's ability to distinguish things by their colour and this discrimination can be further affected by the intensity or brightness and or the size of the coloured object and its relationship to the background setting. For example, some people with colour deficiency will rely on visual cues such as the position of lights on a traffic signal rather than the different signal colours.

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NOTES

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